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# Converged Enhanced --- Ethernet Command Reference

Supporting Fabric OS v6.4.0

**BROCADE**

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## Document History

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<i>Converged Enhanced Ethernet Command Reference</i>	53-1001217-01	New document	March 2009
<i>Converged Enhanced Ethernet Command Reference</i>	53-1001347-01	Updated for 6.3.0 Added new commands for 802.1x Port Authentication	July 2009
<i>Converged Enhanced Ethernet Command Reference</i>	53-1001762-01	Added new commands for IGMP	March 2010

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## How this document is organized

This document is organized to help you find the information that you want as quickly and easily as possible.

The document contains the following components:

- [Chapter 1, “CLI Basics”](#) describes how to access the switch and the CEE CLI command modes.
- [Chapter 2, “Configuration Management Commands”](#) describes the commands to manage the configuration files and includes other file management commands.
- [Chapter 3, “VLAN Commands”](#) describes the commands to create and manage Virtual LAN interfaces.
- [Chapter 4, “Interface Commands”](#) describes the commands to configure interfaces.
- [Chapter 5, “Link Layer Discovery Protocol Commands”](#) describes the commands that support the Link Layer Discovery Protocol (LLDP) implementation.
- [Chapter 6, “Link Aggregation Control Protocol Commands”](#) describes the commands to clear counters of all LACP aggregators or a given LACP aggregator.
- [Chapter 7, “Layer 2 System Commands”](#) describes the commands to configure Layer 2 features.
- [Chapter 8, “Layer 2 ACL commands”](#) describes the commands to configure, manage, and view MAC addresses.
- [Chapter 9, “Spanning Tree Protocol Commands”](#) describes the commands to configure the Spanning Tree Protocol (STP), Rapid Spanning Tree Protocol (RSTP), and Multiple Spanning Tree Protocol (MSTP).
- [Chapter 10, “Internet Group Management Protocol Commands”](#) describes the commands used to configure and maintain IGMP snooping.

- [Chapter 11, “RMON Commands”](#) describes the Remote Network Monitoring (RMON) commands used to monitor and collect long-term statistics.
- [Chapter 12, “QoS Commands”](#) describes the commands used to enable Quality of Service on the device.
- [Chapter 13, “Port Authentication Commands”](#) describes the 802.1x port authentication configuration commands.

## Supported hardware and software

This document includes updated information specific to Fabric OS 6.4.0. The following hardware platforms are supported in this release:

- Brocade 300
- Brocade 4100
- Brocade 4900
- Brocade 5000
- Brocade 5100
- Brocade 5300
- Brocade 5410
- Brocade 5424
- Brocade 5450
- Brocade 5480
- Brocade 7500
- Brocade 7500E
- Brocade 7600
- Brocade 7800
- Brocade 8000
- Brocade Encryption Switch
- Brocade VA-40FC
- Brocade 48000
- Brocade DCX
- Brocade DCX-4S

Within this manual, any appearance of the term “Brocade FCoE hardware” is referring to:

- Brocade 8000
- Brocade FCOE10-24 port blade

Although many different software and hardware configurations are tested and supported by Brocade Communications Systems, Inc. for Fabric OS 6.4.0, documenting all possible configurations and scenarios is beyond the scope of this document.

To obtain information about an OS version other than 6.4.0, refer to the documentation specific to that OS version.

# What's new in this document

This document has been updated for 6.4.0.

New commands have been added for:

- Internet Group Management Protocol

For further information about new features and documentation updates for this release, refer to the release notes.

## Document conventions

This section describes text formatting conventions and important notice formats used in this document.

### Text formatting

The narrative-text formatting conventions that are used are as follows:

<b>bold text</b>	Identifies command names Identifies the names of user-manipulated GUI elements Identifies keywords and operands Identifies text to enter at the GUI or CLI
<i>italic text</i>	Provides emphasis Identifies variables Identifies paths and Internet addresses Identifies document titles
<code>code text</code>	Identifies CLI output Identifies command syntax examples

For readability, command names in the narrative portions of this guide are presented in mixed lettercase: for example, **switchShow**. In actual examples, command lettercase is all lowercase.

### Command syntax conventions

Command syntax in this manual follows these conventions:

**TABLE 1** Command syntax conventions

Convention	Description
<b>bold face font</b>	Commands and keywords.
<i>italic</i>	Variables for which you supply values.
[ ]	Keywords or arguments that appear within square brackets are optional.
{x   y   z}	A choice of required keywords appears in braces separated by vertical bars. You must select one.
<code>screen font</code>	Examples of information displayed on the screen.

**TABLE 1**      **Command syntax conventions**

Convention	Description
<>	Nonprinting characters, for example passwords, appear in angle brackets
[]	Default responses to system prompts appear in square brackets.

## Notes, cautions, and warnings

The following notices and statements are used in this manual. They are listed below in order of increasing severity of potential hazards.

---

### NOTE

A note provides a tip, guidance, or advice, emphasizes important information, or provides a reference to related information.

---

### ATTENTION

An Attention statement indicates potential damage to hardware or data.

---



### CAUTION

A Caution statement alerts you to situations that can be potentially hazardous to you or cause damage to hardware, firmware, software, or data.

---



### DANGER

A Danger statement indicates conditions or situations that can be potentially lethal or extremely hazardous to you. Safety labels are also attached directly to products to warn of these conditions or situations.

---

## Key terms

For definitions specific to Brocade and Fibre Channel, see the technical glossaries on Brocade Connect. See "[Brocade resources](#)" on page xv for instructions on accessing Brocade Connect.

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Oracle Corporation	Oracle, Java

Corporation	Referenced Trademarks and Products
Netscape Communications Corporation	Netscape
Red Hat, Inc.	Red Hat, Red Hat Network, Maximum RPM, Linux Undercover

## Additional information

This section lists additional Brocade and industry-specific documentation that you might find helpful.

### Brocade resources

To get up-to-the-minute information, go to <http://my.brocade.com> and register at no cost for a user ID and password.

White papers, online demonstrations, and data sheets are available through the Brocade website at:

<http://www.brocade.com/products-solutions/products/index.page>

For additional Brocade documentation, visit the Brocade website:

<http://www.brocade.com>

Release notes are available on the Brocade Connect website and are also bundled with the Fabric OS firmware.

### Other industry resources

White papers, online demonstrations, and data sheets are available through the Brocade website at <http://www.brocade.com/products/software.jhtml>.

- Best practice guides, white papers, data sheets, and other documentation is available through the Brocade Partner website.

For additional resource information, visit the Technical Committee T11 website. This website provides interface standards for high-performance and mass storage applications for Fibre Channel, storage management, and other applications:

<http://www.t11.org>

For information about the Fibre Channel industry, visit the Fibre Channel Industry Association website:

<http://www.fibrechannel.org>

# Getting technical help

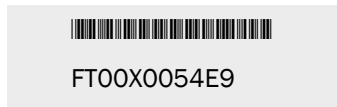
Contact your switch support supplier for hardware, firmware, and software support, including product repairs and part ordering. To expedite your call, have the following information available:

## 1. General Information

- Switch model
- Switch operating system version
- Error numbers and messages received
- **supportSave** command output
- Detailed description of the problem, including the switch or fabric behavior immediately following the problem, and specific questions
- Description of any troubleshooting steps already performed and the results
- Serial console and Telnet session logs
- syslog message logs

## 2. Switch Serial Number

The switch serial number and corresponding bar code are provided on the serial number label, as illustrated below:



The serial number label is located as follows:

- *Brocade 300, 4100, 4900, 5100, 5300, 7500, 7800, 8000, VA-40FC, and Brocade Encryption Switch*—On the switch ID pull-out tab located inside the chassis on the port side on the left
- *Brocade 5000*—On the switch ID pull-out tab located on the bottom of the port side of the switch
- *Brocade 7600*—On the bottom of the chassis
- *Brocade 48000*—Inside the chassis next to the power supply bays
- *Brocade DCX*—On the bottom right on the port side of the chassis
- *Brocade DCX-4S*—On the bottom right on the port side of the chassis, directly above the cable management comb

## 3. World Wide Name (WWN)

Use the **licenseldShow** command to display the WWN of the chassis.

If you cannot use the **licenseldShow** command because the switch is inoperable, you can get the WWN from the same place as the serial number, except for the Brocade DCX. For the Brocade DCX, access the numbers on the WWN cards by removing the Brocade logo plate at the top of the nonport side of the chassis.



## Document feedback

Quality is our first concern at Brocade and we have made every effort to ensure the accuracy and completeness of this document. However, if you find an error or an omission, or you think that a topic needs further development, we want to hear from you. Forward your feedback to:

`documentation@brocade.com`

Provide the title and version number of the document and as much detail as possible about your comment, including the topic heading and page number and your suggestions for improvement.



# CLI Basics

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## In this chapter

- [Accessing the Brocade CEE Switch](#) ..... 1
- [CLI command modes](#) ..... 1
- [L2 ACL commands](#) ..... 3

## Accessing the Brocade CEE Switch

After you log on to the switch, you can access the commands through a serial terminal port or a Telnet session. When you Telnet into the switch, you are prompted to enter a login name and password. When you log on to a switch supporting CEE, all of the 10 Gbps ports are disabled and must be enabled. Refer to the *Fibre Channel over Ethernet Administrator's Guide* for information regarding feature configuration and management procedures.

Following is an example of logging in to a switch supporting FCoE and CEE.

```
telnet 10.32.152.21
switch login: admin
Password:xxxxxx
switch cmsh - cmsh takes you to the CEE Brocade8000 CLI prompt.
switch>
```

## CLI command modes

Following are the main command modes for the Brocade FCoE hardware:

- EXEC
- Privileged EXEC
- Global configuration
- Interface configuration
- Feature configuration
  - CEE map: switch (config-ceemap)
  - Standard ACL: switch (conf-macl-std)
  - Extended ACL: switch (conf-macl-ext)
- Console and VTY (line) configuration

[Table 2](#) lists the main command modes, how to access each mode, the prompt you see in that mode, and how to exit that mode. The prompts listed use the default name switch.

# 1 CLI command modes

**TABLE 2** Accessing the CEE CLI command modes

Command mode	Prompt	How to access the command mode	Description
EXEC	switch>	Enter the <b>cmsh</b> command at the Fabric OS prompt after you have logged in as an appropriate user.	Display running system information and set terminal line parameters.
Privileged EXEC	switch#	From the EXEC mode, enter the <b>enable</b> command.	This is the administrative mode which also includes EXEC mode commands and allows you to display and change system parameters.
Global configuration	switch(config)#	From the EXEC mode, enter the <b>configure terminal</b> EXEC command.	Configure features that affect the entire switch.
Interface configuration	Port-channel: switch (conf-if-po-63)#  10-Gigabit Ethernet (CEE port): switch (conf-if-te-0/1)#  VLAN: switch (conf-if-vl-1)#	From the global configuration mode, specify an interface by entering one of the following interface types: <ul style="list-style-type: none"> <li>• <b>interface port-channel</b></li> <li>• <b>interface tengigabitethernet</b></li> <li>• <b>interface vlan</b></li> </ul>	Access and configure individual interfaces.
Protocol configuration	LLDP: switch (conf-lldp)#  Spanning-tree: switch (conf-mstp)# switch (conf-rstp)# switch (conf-stp)#	From the global configuration mode, specify a protocol by entering one of the following protocol types: <ul style="list-style-type: none"> <li>• <b>protocol lldp</b></li> <li>• <b>protocol spanning-tree mstp</b></li> <li>• <b>protocol spanning-tree rstp</b></li> <li>• <b>protocol spanning-tree stp</b></li> </ul>	Access and configure protocols.
Feature configuration	CEE map: switch (config-ceemap)#  Standard ACL: switch (conf-macl-std)#  Extended ACL: switch (conf-macl-ext)#	From the global configuration mode, specify a CEE feature by entering one of the following feature names: <ul style="list-style-type: none"> <li>• <b>cee-map</b></li> <li>• <b>mac access-list</b></li> </ul>	Access and configure CEE features.
Console and VTY (line) configuration	switch (config-line)#	From the global configuration mode, configure a terminal connected through the console port by entering the <b>line console</b> command. Configure a terminal connected through a Telnet session by entering the <b>line vty</b> command.	Configure a terminal connected through the console port or a terminal connected through a Telnet session.

## L2 ACL commands

Use Layer 2 Media Access Control (MAC) list commands to do the following:

- Identify traffic based on the MAC-addresses, such as VLAN IDs and different encapsulations.
- Configure multiple access-lists or rules and store them in a configuration.
- After you apply the access list either to an interface, a Virtual Teletype (VTY), or through a command using the access-list keyword, it becomes effective.

Following are the two types of access list commands:

- **Standard Access Control Lists**

Standard Access Control Lists filter the traffic on a source address and block traffic close to a destination. There are exceptions when the address in a standard access list is not a source address. When using a Telnet session, for outbound VTY access lists, the address in the access list entry is used as a destination address instead of a source address.

- **Extended Access Control Lists**

Extended Access Lists block traffic based on any given packet attribute. Use Extended access control lists to test source and destination addresses and other IP packet data, such as protocols, TCP or UDP port numbers, type of service and to provide Reflective access-lists and Time-based access-lists.capabilities.

# 1 L2 ACL commands

# Configuration Management Commands

---

## copy

Copies one file to another location.

**Synopsis** `copy source-file-url destination-file-url`

**Operands**

<i>source-file-url</i>	Specifies location of the source file to be copied using one of the following formats:
FLASH	Copies from URL [flash://]filename
FTP	Copies from URL ftp://[username[:password]@server/path]
SCP	Copies from URL scp://[username[:password]@server/path]
<i>destination-file-url</i>	Specifies the destination file using one of the following formats:
FLASH	Copies to URL [flash://]filename
FTP	Copies to URL ftp://[username[:password]@server/path]
SCP	Copies to URL scp://[username[:password]@server/path]
running-config	Copies to the current running configuration.
startup-config	Copies to the current startup configuration file.

**Defaults** There are no usage guidelines for this command.

**Command Modes** Privileged EXEC mode

**Description** Use this command to copy a file to another location.

**Usage Guidelines** There are no usage guidelines for this command.

**Examples** To copy the source file to a remote machine using FTP:

```
switch#copy ftp://user@10.10.10.10/file1 file2
Source password[ ]?
```

To copy the source file from a remote machine using SCP:

```
switch#copy scp://user:password@10.10.10.10/file1 file2
```

To copy the source file from a local switch:

```
switch#copy flash://file1 file2
```

**See Also** `write erase`, `copy running-config`

## copy startup-config

Copies the startup configuration file to a network server or a file URL.

**Synopsis** `copy startup-config destination-file-url`

**Operands** *destination-file-url* Specifies the destination path to which the **startup-config** is to be copied using the following formats:

FLASH	Copies to URL [flash://]filename
FTP	Copies to URL ftp://[username[:password]@server/path]
SCP	Copies to URL scp://[username[:password]@server/path]
running-config	Copies to the current running configuration.

**Defaults** There are no default configurations for this command.

**Command Modes** Privileged EXEC mode

**Description** Use this command to copy the startup configuration file to a network server or a file URL.

**Usage Guidelines** The following guidelines apply when using this command:

- An error displays if there is no startup configuration file, for example:  

```
switch #copy startup-config file2
% Error: No Startup-config.
```
- Use the **write memory** command to add entries in the startup configuration file.
- Use the **write erase** command to delete entries from the startup configuration file.

**Examples** To copy the startup configuration file to the local switch:

```
switch#copy startup-config file2
Building configuration...

switch#copy startup-config flash://file2
Building configuration...
```

To copy the startup configuration file to a remote server through FTP:

```
switch#copy startup-config ftp://admin@10.10.10.10/file2
Source password[]?
Building configuration...
```

To copy the startup configuration file to a remote server through SCP:

```
switch#copy startup-config scp://admin@10.10.10.10/file2
Source password[]?
Building configuration...
```

**See Also** **write erase**, **copy running-config**



## delete

Deletes a specified file from the Flash.

**Synopsis**     **delete** *filename*

**Operands**    *filename*               Specifies the name of the file to be deleted from the Flash of the local switch using the following format: [flash://]*filename*.

**Defaults**    There is no default configuration for this command.

**Command Modes**   Privileged EXEC mode

**Description**    Use this command to delete a file from the Flash. After the file is deleted, it cannot be restored.

**Usage Guidelines**   There are no usage guidelines for this command.

**Examples**       To delete a file from the Flash:

```
switch#delete file1
% Warning: File will be deleted (from flash:)!
Continue? (y/n):y
```

[or]

```
switch#delete flash://file1
% Warning: File will be deleted (from flash:)!
Continue? (y/n):y
```

**See Also**       **copy startup-config**

## 2 dir

### dir

Lists the contents of the current directory.

**Synopsis** dir

**Operands** none

**Defaults** The default is the current directory.

**Command Modes** Privileged EXEC mode

**Description** Use this command to list the contents of the current directory.

**Usage Guidelines** There are no usage guidelines for this command.

**Examples** To list the contents of the current directory:

```
switch#dir
Contents of flash://
-rw-r-----      1276   Wed Feb  4 07:08:49 2009   startup_rmon_config
-rw-r-----      1276   Wed Feb  4 07:10:30 2009     rmon_config
-rw-r-----      1276   Wed Feb  4 07:12:33 2009   rmon_configuration
-rw-r-----      1276   Wed Feb  4 10:18:15 2009   starup-config
```

**See Also** delete

## disable

Exits the Privileged EXEC mode and returns to the EXEC mode.

<b>Synopsis</b>	<b>disable</b>
<b>Operands</b>	none
<b>Defaults</b>	There are no default configurations for this command.
<b>Command Modes</b>	Privileged EXEC mode
<b>Description</b>	Use this command to exit the Privileged EXEC mode and return to the EXEC mode.
<b>Usage Guidelines</b>	This is the only command that allows you to return to the EXEC mode. Using the <b>exit</b> or <b>quit</b> commands from the Privileged EXEC mode ends the session instead of returning to the EXEC mode.
<b>Examples</b>	To return to the EXEC mode: <pre>switch#<b>disable</b> switch&gt;</pre>
<b>See Also</b>	<b>enable, end, exit</b>

## 2 do

### do

Allows you to run commands in EXEC mode from the configuration mode.

<b>Synopsis</b>	<b>do</b> <i>command</i>
<b>Operands</b>	<i>command</i> Specifies the command you want to run.
<b>Defaults</b>	There are no default configurations for this command.
<b>Command Modes</b>	All configuration modes
<b>Description</b>	Use this command to save time when you are configuring the switch in any configuration mode and you want to run a command in the Privileged EXEC mode.
<b>Usage Guidelines</b>	There are no usage guidelines for this command.
<b>Examples</b>	To run the <b>clear counters all</b> command with the <b>do</b> command: <pre>switch(config)#do clear counters all switch(config)#</pre> To display the contents from the working directory using the <b>do</b> command: <pre>switch(config)#do dir Contents of flash:// -rw-r-----      1276   Wed Feb  4 07:08:49 2009   startup_rmon_config -rw-r-----      1276   Wed Feb  4 07:10:30 2009     rmon_config -rw-r-----      1276   Wed Feb  4 07:12:33 2009     rmon_configuration -rw-r-----      1276   Wed Feb  4 10:48:59 2009     starup-config switch(config)#</pre>
<b>See Also</b>	none

## enable

Enables the Privilege EXEC mode.

**Synopsis**     **enable**

**Operands**    none

**Defaults**    There are no default configurations for this command.

**Command Modes**   EXEC mode

**Description**    Use this command to enable the Privileged EXEC command mode.

**Usage Guidelines**   To return to the EXEC mode from Privileged EXEC mode, use the **disable** command. Using the **exit** or **quit** command from the Privileged EXEC mode ends the session.

**Examples**        To enable the Privileged EXEC mode:

```
switch> enable
switch#
```

**See Also**        **disable**

2 end

## end

Returns to the Privileged EXEC command mode from all configuration modes.

<b>Synopsis</b>	<b>end</b>
<b>Operands</b>	none
<b>Defaults</b>	There are no default configurations for this command.
<b>Command Modes</b>	All configuration modes
<b>Description</b>	Use this command to return to the Privileged EXEC command mode from any command mode.
<b>Usage Guidelines</b>	There are no usage guidelines for this command.
<b>Examples</b>	To return to the Privileged EXEC mode from interface configuration mode: <pre>switch(config)#<b>interface</b> tengigabitethernet 0/0 switch(conf-if-te-0/0)#<b>end</b> switch#</pre>
<b>See Also</b>	<b>exit, disable, enable</b>

## erase flash

Erases all the files from the Flash.

<b>Synopsis</b>	<b>erase flash</b>
<b>Operands</b>	none
<b>Defaults</b>	There are no default configurations for this command.
<b>Command Modes</b>	Configuration mode
<b>Description</b>	Use this command to erase the files from the Flash.
<b>Usage Guidelines</b>	There are no usage guidelines for this command.
<b>Examples</b>	To erase the files from the Flash: <pre>switch#<b>erase flash</b> %% Warning: Erasing flash filesystem will remove all files in flash://. Continue to erase?(y/n):y switch#</pre>
<b>See Also</b>	<b>dir, delete</b>

## exec-timeout

Sets the interval that the EXEC command interpreter wait for user input.

**Synopsis** `exec-timeout minutes seconds`

`no exec-timeout`

**Operands** `minutes` Specifies the time interval in minutes. The range is 0-35791.  
`seconds` Specifies the time interval in seconds. The range is 0-2147483.

**Defaults** The default is 10 minutes.

**Command Modes** Console and VTY (line) configuration mode

**Description** Use this command to set the interval; the command interpreter waits for user input detected. Use **no exec-timeout** to disable the wait interval that the command interpreter waits.

**Usage Guidelines** The **exec-timeout** command is used to set the time the Telnet session waits for an idle VTY session, before it time outs. An exec-timeout setting of 0 (zero) causes the Telnet session to wait indefinitely.

**Examples** To configure the wait interval for the console session:

```
switch(config)#line console 0
switch(conf-line)#exec-timeout 2 30

switch(config)#line vty 0 9
switch(conf-line)#exec-timeout 30 30
```

**See Also** `show line`, `line vty`, `line console`



## exit

Exits the current mode and returns to the previous mode.

<b>Synopsis</b>	<b>exit</b>
<b>Operands</b>	none
<b>Defaults</b>	There are no default configurations for this command.
<b>Command Modes</b>	All command modes
<b>Description</b>	Use this command to exit the current mode, and return to the previous mode. When used in EXEC and Privileged EXEC modes, the <b>exit</b> command terminates the session.
<b>Usage Guidelines</b>	There are no usage guidelines for this command.
<b>Examples</b>	To exit the Interface configuration mode, and return to the Configuration mode: <pre>switch(config)#<b>interface</b> tengigabitethernet 0/0 switch(conf-if-te-0/0)#<b>exit</b> switch(config)#<b>exit</b></pre>
<b>See Also</b>	<b>end, enable, disable</b>

**fos**

Executes Fabric OS commands from the from the cmsh shell.

<b>Synopsis</b>	<b>fos</b> <i>command</i>
<b>Operands</b>	<i>command</i> Specifies the Fabric OS command.
<b>Defaults</b>	There are no default configurations for this command.
<b>Command Modes</b>	Privileged EXEC mode
<b>Description</b>	Use this command to execute the following Fabric OS commands from the cmsh shell. <b>alishow</b> <b>cfgactvshow</b> <b>cfgshow</b> <b>errclear</b> <b>errshow</b> <b>fabricshow</b> <b>fcoe</b> <b>firmwareshow</b> <b>ipaddrshow</b> <b>nsallshow</b> <b>nscamshow</b> <b>nsshow</b> <b>portcfg</b> <b>portcfgshow</b> <b>portdisable</b> <b>portenable</b> <b>porterrshow</b> <b>portlogshow</b> <b>portperfshow</b> <b>portrouteshow</b> <b>portstatsclear</b> <b>portstatsshow</b> <b>slotpoweroff</b> <b>slotpoweron</b> <b>slotshow</b>

**supportsave**

**switchshow**

**zonestow**

**Usage Guidelines** The Fabric OS syntax applies to the listed commands. The **fcoelogincfg**, **fcoelogingroup**, and **fcoelogincfg** commands are not supported from cmsh shell. See the *Fabric OS Command Reference* for additional information on these commands.

**Examples** To run the Fabric OS command **switchshow** from the Privilege EXEC mode:

```
switch#fos switchshow
switchName:      switch
switchType:      76.6
switchState:     Online
switchMode:      Native
switchRole:      Principal
switchDomain:    1
switchId:        fffc01
switchWwn:       10:00:00:05:1e:76:42:00
zoning:          OFF
switchBeacon:    OFF
```

Area	Port	Media	Speed	State	Proto	
0	0	--	N8	No_Module	FC	
1	1	--	N8	No_Module	FC	
2	2	--	N8	No_Module	FC	
3	3	--	N8	No_Module	FC	
4	4	--	N8	No_Module	FC	
5	5	--	N8	No_Module	FC	
6	6	--	N8	No_Module	FC	
7	7	--	N8	No_Module	FC	
8	8	--	10	Online	FCoE F-Port	20:08:00:05:1e:76:42:00
9	9	--	10	Online	FCoE F-Port	20:09:00:05:1e:76:42:00
10	10	--	10	Online	FCoE F-Port	20:0a:00:05:1e:76:42:00
11	11	--	10	Online	FCoE F-Port	20:0b:00:05:1e:76:42:00
12	12	--	10	Online	FCoE F-Port	20:0c:00:05:1e:76:42:00
13	13	--	10	Online	FCoE F-Port	20:0d:00:05:1e:76:42:00

**See Also** none

## line console

Configures the Line configuration mode.

<b>Synopsis</b>	<b>line console 0</b>
<b>Operands</b>	none
<b>Defaults</b>	There are no default configurations for this command.
<b>Command Modes</b>	Global configuration mode
<b>Description</b>	Use this command to configure the Line configuration mode, which allows you to configure the virtual terminal line settings.
<b>Usage Guidelines</b>	There are no usage guidelines for this command.
<b>Examples</b>	To configure the wait interval for the console session: <pre>switch&gt;enable switch#configure terminal switch(config)#line console 0 switch(config-line)#exec-timeout 2 30 switch(config-line)#exit</pre>
<b>See Also</b>	<b>show line</b>

## line vty

Configures the virtual terminal line setting to allow you to set the wait time interval for the Telnet session to time out.

**Synopsis** `line vty first number last number`

**Operands** `first number` Specifies the first line number. The range of valid values is 0-31.

`last number` Specifies the last line number. The range of valid values is 0-31.

**Defaults** There are no default configurations for this command.

**Command Modes** Global configuration mode

**Description** Use this command to configure the virtual terminal line settings to set the exec-timeout.

**Usage Guidelines** There are no usage guidelines for this command.

**Examples** To configure the wait interval for the telnet session to time out after 2 minutes, 30 seconds if there is no response from the user:

```
switch#configure terminal
switch(config)#line vty 23 31
switch(conf-line)#exec-timeout 2 30
```

**See Also** `show line`

## 2 pwd

### pwd

Print Working Directory (**pwd**); displays the contents of the current working directory.

<b>Synopsis</b>	<b>pwd</b>
<b>Operands</b>	none
<b>Defaults</b>	There are no default configurations for this command.
<b>Command Modes</b>	Privileged EXEC mode
<b>Description</b>	Use this command to view the current working directory.
<b>Usage Guidelines</b>	There are no usage guidelines for this command.
<b>Examples</b>	To view the current working directory: <pre>switch#<b>pwd</b> flash:</pre>
<b>See Also</b>	none

## rename

Renames a file in the Flash.

**Synopsis** `rename sourcefile renamedfile`

**Operands** `sourcefile` Specifies the file name to change.  
`renamedfile` Specifies the new name of the file.

**Defaults** There are no default configurations for this command.

**Command Modes** Privileged EXEC mode

**Description** Use this command to rename a file in the Flash.

**Usage Guidelines** There are no usage guidelines for this command.

**Examples** To rename a file in the Flash:

```
switch#rename file1 file2
switch#dir
Contents of flash://
-rw-r-----      1276   Wed Feb  4 13:16:00 2009 file2
```

**See Also** none

## show calendar

View the current date and time based on the switch hardware clock.

**Synopsis**    **show calendar**

**Operands**    none

**Defaults**    There are no default configurations for this command.

**Command Modes**    Privileged EXEC mode

**Description**    Use this command to display the current date and time based on the switch hardware clock.

**Usage Guidelines**    There are no usage guidelines for this command.

**Examples**    To display calendar information:

```
switch#show calendar  
16:33:30 UTC Tue Feb 14 2009
```

**See Also**    none



## show clock

Displays the time and date from the system clock.

**Synopsis**     **show clock**

**Operands**    none

**Defaults**    There are no default configurations for this command.

**Command Modes**   Privileged EXEC mode

**Description**    Use this command to display the time and date from the system clock.

**Usage Guidelines**   There are no usage guidelines for this command.

**Examples**       To display the time and date from the system clock:

```
switch#show clock  
23:45:55.512800 UTC Wed Feb 18 2009
```

**See Also**       **show calendar**

## show environment

Displays fan, temperature, redundant power system (RPS) availability, and power information for the switch.

**Synopsis** show environment

**Operands** none

**Defaults** There are no default configurations for this command.

**Command Modes** Privileged EXEC mode

**Description** Use this command to display fan, temperature, redundant power system (RPS) availability, and power information for the switch.

**Usage Guidelines** There are no usage guidelines for this command.

**Examples** To display both fan and temperature environmental status:

```
switch#show environment
-- Fan Status --
Fan 1 is Ok
Fan 2 is Ok
Fan 3 is Ok

-- Power Supplies --
PS0 is OK
PS1 is faulty

-- Unit Environment Status --
Sensor State          Centigrade    Fahrenheit
ID
=====
 1    Ok              44            111
 2    Ok              40            104
 3    Ok              47            116
 4    Ok              32             89
```

**See Also** none

## show file

Displays the contents of a text file in the local Flash.

**Synopsis**     **show file** *file\_name*

**Operands**    *file\_name*           Specifies the file whose contents are to be displayed.

**Defaults**    There are no default configurations for this command.

**Command Modes**   Privileged EXEC mode

**Description**    Use this command to display the contents of a text file in the local Flash.

**Usage Guidelines**   There are no usage guidelines for this command.

**Examples**       To show the file system for internal flash:

```
switch#show file flash://file1
!
protocol spanning-tree mstp
  instance 1 vlan 100
!

[or]

switch#show file file1
!
protocol spanning-tree mstp
  instance 1 vlan 100
!
```

**See Also**     **dir**

## show line

Displays line parameters.

**Synopsis** `show line [first line number] [last line number]`

**Operands** `first line number` Specifies the first line number. The range of valid values is 0-31.  
`last line number` Specifies the last line number. The range of valid values is 0-31.

**Defaults** If the line is not specified, it displays all VTY and console information.

**Command Modes** Privileged EXEC mode

**Description** Use this command to display line parameters.

**Usage Guidelines** There are no usage guidelines for this command.

**Examples** To display line parameters:

```
switch#show line 10 22
  Status      Type           Timeout (m/s)   Length
  Idle        console 0       10:0            24
  Idle        vty 10          10:0            24
  Idle        vty 11          10:0            24
  Idle        vty 12          10:0            24
  Idle        vty 13          10:0            24
  Idle        vty 14          10:0            24
  Idle        vty 15          10:0            24
  Idle        vty 16          10:0            24
  Idle        vty 17          10:0            24
  Idle        vty 18          10:0            24
  Idle        vty 19          10:0            24
  Idle        vty 20          10:0            24
  Idle        vty 21          10:0            24
  Idle        vty 22          121:1212       24

switch#show line 0
  Status      Type           Timeout (m/s)   Length
  Idle        console 0       10:0            24
  * Active    vty 0          10:0            24
```

**See Also** `line vty`, `line console`, `exec-timeout`

## show logging

Displays the internal syslog buffer of the switch.

<b>Synopsis</b>	<b>show logging</b>
<b>Operands</b>	none
<b>Defaults</b>	There are no default configurations for this command.
<b>Command Modes</b>	Privileged EXEC mode
<b>Description</b>	Use this command to display the RASlog messages stored in the internal buffer.
<b>Usage Guidelines</b>	The RASlog messages contain the module name, error code, and message details.
<b>Examples</b>	To display the syslog messages stored in the internal buffer: <pre>switch#show logging Fabos OS Version: v6.1.2  Number of Messages: 1024  2009/02/03-00:19:43: %NSM-4-1001: Interface TenGigabitEthernet 0/4 is online. 2009/02/03-00:20:14: %NSM-4-1002: Interface TenGigabitEthernet 0/4 is protocol down. 2009/02/03-00:20:14: %NSM-4-1001: Interface TenGigabitEthernet 0/4 is online. 2009/02/03-00:21:10: %NSM-4-1003: Interface Port-channel 10 is link down</pre>
<b>See Also</b>	none

## show media

Displays the SFP information for all the interfaces present on a switch.

<b>Synopsis</b>	<b>show media</b>
<b>Operands</b>	none
<b>Defaults</b>	There are no default configurations for this command.
<b>Command Modes</b>	Privileged EXEC mode
<b>Description</b>	Use this command to display a summary of all SFP information for the switch. The output will be several pages long.
<b>Usage Guidelines</b>	There are no usage guidelines for this command.
<b>Examples</b>	To display all SFP information:

```

switch#show media
Interface          TenGigabitEthernet 0/1
  Identifier        3      SFP
  Connector         7      LC
  Transceiver       0000000000000010 10_GB/s
  Name              id
  Encoding          6
  Baud Rate         103 (units 100 megabaud)
  Length 9u         0      (units km)
  Length 9u         0      (units 100 meters)
  Length 50u        8      (units 10 meters)
  Length 62.5u     3      (units 10 meters)
  Length Cu         0      (units 1 meter)
  Vendor Name       BROCADE
  Vendor OUI        42:52:4f
  Vendor PN         57-0000075-01
  Vendor Rev        A
  Wavelength        850 (units nm)
  Options           001a Loss_of_Sig,Tx_Fault,Tx_Disable
  BR Max            0
  BR Min            0
  Serial No         AAA108454100431
  Date Code         081108
  Temperature       44 Centigrade
  Voltage           3246.8 (Volts)
  Current           0.002 (mAmps)
  TX Power          0.1 (uWatts)
  RX Power          0.1 (uWatts)
(output truncated)

```

**See Also** show media interface, show media linecard

## show media interface

Displays the SFP information for a specific interface.

<b>Synopsis</b>	<b>show media interface</b>
<b>Operands</b>	<b>tengigabitethernet</b> Specifies a valid 10 Gbps Ethernet interface.
	<i>slot</i> Specifies a valid slot number.
	<i>port</i> Specifies a valid port number.
<b>Defaults</b>	There are no default configurations for this command.
<b>Command Modes</b>	Privileged EXEC mode
<b>Description</b>	Use this command to display a summary of the SFP information for the specified interface.
<b>Usage Guidelines</b>	There are no usage guidelines for this command.
<b>Examples</b>	To display SFP information for 10 Gbps Ethernet interface:

```
switch#show media interface tengigabitethernet 0/1
Interface          TenGigabitEthernet 0/1
  Identifier        3      SFP
  Connector         7      LC
  Transceiver       0000000000000010 10_GB/s
  Name              id
  Encoding          6
  Baud Rate         103 (units 100 megabaud)
  Length 9u        0      (units km)
  Length 9u        0      (units 100 meters)
  Length 50u       8      (units 10 meters)
  Length 62.5u    3      (units 10 meters)
  Length Cu        0      (units 1 meter)
  Vendor Name       BROCADE
  Vendor OUI        42:52:4f
  Vendor PN         57-0000075-01
  Vendor Rev        A
  Wavelength        850 (units nm)
  Options           001a Loss_of_Sig,Tx_Fault,Tx_Disable
  BR Max            0
  BR Min            0
  Serial No         AAA108454100431
  Date Code         081108
  Temperature       44 Centigrade
  Voltage           3246.8 (Volts)
  Current           0.002 (mAmps)
  TX Power          0.1 (uWatts)
  RX Power          0.1 (uWatts)
```

**See Also** [show media](#), [show media linecard](#)

## show media linecard

Displays the SFP information for all the interfaces of a specific line card.

<b>Synopsis</b>	<b>show media linecard</b> <i>number</i>
<b>Operands</b>	<i>number</i> Linecard number.
<b>Defaults</b>	There are no default configurations for this command.
<b>Command Modes</b>	Privileged EXEC mode
<b>Description</b>	Use this command to display a summary of the SFP information for a specific line card. The output contains information for each interface on the line card, and is several pages long.
<b>Usage Guidelines</b>	There are no usage guidelines for this command.
<b>Examples</b>	To show the SFP information for line card number 0:

```

switch#show media linecard 0
Interface            TenGigabitEthernet 0/1
  Identifier        3     SFP
  Connector        7     LC
  Transceiver      0000000000000010 10_GB/s
  Name             id
  Encoding         6
  Baud Rate        103 (units 100 megabaud)
  Length 9u        0     (units km)
  Length 9u        0     (units 100 meters)
  Length 50u       8     (units 10 meters)
  Length 62.5u     3     (units 10 meters)
  Length Cu        0     (units 1 meter)
  Vendor Name      BROCADE
  Vendor OUI       42:52:4f
  Vendor PN        57-0000075-01
  Vendor Rev       A
  Wavelength       850 (units nm)
  Options           001a Loss_of_Sig,Tx_Fault,Tx_Disable
  BR Max           0
  BR Min           0
  Serial No        AAA108454100431
  Date Code        081108
  Temperature      44 Centigrade
  Voltage           3246.8 (Volts)
  Current           0.002 (mAmps)
  TX Power         0.1 (uWatts)
  RX Power         0.1 (uWatts)
(output truncated)

```

**See Also**    **show media interface, show media**



## show processes cpu

Displays information about the active processes in the switch and their corresponding CPU utilization statistics.

<b>Synopsis</b>	<b>show processes cpu summary</b>
<b>Operands</b>	<b>summary</b> Shows a summary of CPU usage by all processes.
<b>Defaults</b>	There are no default configurations for this command.
<b>Command Modes</b>	Privileged EXEC mode
<b>Description</b>	Use this command to display information about the active processes in the switch and their corresponding CPU utilization statistics.
<b>Usage Guidelines</b>	There are no usage guidelines for this command.
<b>Examples</b>	<p>To show the information for all processes:</p> <pre>switch#show processes cpu summary CPU Utilization current: 0.90%; One minute: 0.00%; Five minutes: 0.00%; Fifteen minutes: 0.00%</pre> <p>To show CPU usage information by individual processes:</p> <pre>switch#show processes cpu CPU Utilization current: 0.90%; One minute: 0.00%; Five minutes: 0.00%; Fifteen minutes: 0.00%   PID  Process          CPU%  State   Started    1   init              0.00  S       14:18:35 Feb 19, 2009    2   ksoftirqd/0       0.00  S       14:18:35 Feb 19, 2009    3   events/0         0.00  S       14:18:35 Feb 19, 2009    4   khelper           0.00  S       14:18:35 Feb 19, 2009    5   kthread           0.00  S       14:18:35 Feb 19, 2009   40   kblockd/0        0.00  S       14:18:35 Feb 19, 2009   73   pdflush          0.00  S       14:18:35 Feb 19, 2009</pre>
<b>See Also</b>	none

## show processes memory

Displays the memory usage information based on processes running in the system.

<b>Synopsis</b>	<b>show processes memory summary</b>																																				
<b>Operands</b>	<b>summary</b> Shows a summary of memory usage by all processes.																																				
<b>Defaults</b>	There are no default configurations for this command.																																				
<b>Command Modes</b>	Privileged EXEC mode																																				
<b>Description</b>	Use this command to view memory usage information based on processes running in the system.																																				
<b>Usage Guidelines</b>	There are no usage guidelines for this command.																																				
<b>Examples</b>	To show a summary of memory usage by all processes:  switch# <b>show processes memory summary</b> %Memory Used: 39.463%; TotalMemory: 1028020 KB; Total Used: 405688 KB; Total Free: 622332 KB  To show memory usage information by individual processes:  switch# <b>show processes memory</b> %Memory Used: 39.463%; TotalMemory: 1028020 KB; Total Used: 405688 KB; Total Free: 622332 KB <table><thead><tr><th>PID</th><th>Process</th><th>MEM%</th><th>Mem Used(bytes)</th><th>Heap Total</th><th>Heap Used</th></tr></thead><tbody><tr><td>1</td><td>init</td><td>0.00</td><td>1736704</td><td>-</td><td>-</td></tr><tr><td>2</td><td>ksoftirqd/0</td><td>0.00</td><td>0</td><td>-</td><td>-</td></tr><tr><td>3</td><td>events/0</td><td>0.00</td><td>0</td><td>-</td><td>-</td></tr><tr><td>4</td><td>khelper</td><td>0.00</td><td>0</td><td>-</td><td>-</td></tr><tr><td>5</td><td>kthread</td><td>0.00</td><td>0</td><td>-</td><td>-</td></tr></tbody></table>	PID	Process	MEM%	Mem Used(bytes)	Heap Total	Heap Used	1	init	0.00	1736704	-	-	2	ksoftirqd/0	0.00	0	-	-	3	events/0	0.00	0	-	-	4	khelper	0.00	0	-	-	5	kthread	0.00	0	-	-
PID	Process	MEM%	Mem Used(bytes)	Heap Total	Heap Used																																
1	init	0.00	1736704	-	-																																
2	ksoftirqd/0	0.00	0	-	-																																
3	events/0	0.00	0	-	-																																
4	khelper	0.00	0	-	-																																
5	kthread	0.00	0	-	-																																
<b>See Also</b>	none																																				

## show running-config

Displays the contents of the configuration file currently running on the system.

<b>Synopsis</b>	<b>show running-config</b> [ <b>access-list</b>   <b>cee-map</b>   <b>interface</b>   <b>lldp</b>   <b>rmon</b>   <b>spanning-tree</b> ]	
<b>Operands</b>	<b>access-list</b>	Displays the running configuration of the access-list.
	<b>cee-map</b>	Displays the QoS Converged Enhanced Ethernet (CEE) maps configuration.
	<b>interface</b>	Displays the interface configuration.
	<b>lldp</b>	Displays the LLDP configuration.
	<b>rmon</b>	Displays the Remote Monitoring Protocol (RMON) configuration.
	<b>spanning-tree</b>	Displays the switch configuration.
<b>Defaults</b>	There are no default configurations for this command.	
<b>Command Modes</b>	Privileged EXEC mode	
<b>Description</b>	Use this command to display the contents of the configuration file currently running on the system. The <b>show running-config</b> command displays only the commands that were successfully executed.	
<b>Usage Guidelines</b>	There are no usage guidelines for this command.	
<b>Examples</b>	To display the content of the current configuration file:	
	<pre> switch#show running-config ! no protocol spanning-tree ! interface Vlan 1 ! interface TenGigabitEthernet 0/0 shutdown ! interface TenGigabitEthernet 0/1 shutdown ! interface TenGigabitEthernet 0/2 shutdown ! interface TenGigabitEthernet 0/3 shutdown ! interface TenGigabitEthernet 0/4 shutdown ! </pre>	
<b>See Also</b>	<b>show startup-config</b>	

## show startup-config

Displays the content of the startup configuration file.

**Synopsis**    **show startup-config**

**Operands**    none

**Defaults**    There are no default configurations for this command.

**Command Modes**    Privileged EXEC mode

**Description**    Use this command to display the contents of the startup configuration file.

**Usage Guidelines**    The following guidelines apply when using this command:

- An error displays if there are no entries in the startup configuration file, for example  

```
switch#show startup-config
% No Startup-config
```
- Use the **write memory** command to add entries to the startup configuration file.
- Using the **write erase** command to delete entries from startup configuration file.

**Examples**    To show the content of the startup configuration file:

```
switch#show startup-config
!
no protocol spanning-tree
!
interface Vlan 1
!
interface TenGigabitEthernet 0/0
shutdown
!
interface TenGigabitEthernet 0/1
shutdown
!
interface TenGigabitEthernet 0/2
shutdown
!
interface TenGigabitEthernet 0/3
shutdown
```

**See Also**    **write memory, write erase**

## show system

Displays system information.

<b>Synopsis</b>	<b>show system</b>
<b>Operands</b>	none
<b>Defaults</b>	There are no default configurations for this command.
<b>Command Modes</b>	Privileged EXEC mode
<b>Description</b>	Use this command to display system information of hardware and software details.
<b>Usage Guidelines</b>	There are no usage guidelines for this command.
<b>Examples</b>	To display the system information:

```
switch#show system
Stack MAC          : 00:05:1E:76:42:00

  -- UNIT 0 --
Unit Name          : switch
Status             : Online
Hardware Rev       : 76.6
FC Port(s)         : 8
Tengig Port(s)    : 24
Up Time            : 18:28:27 up 4:09
FOS Version        : v6.1.2
Jumbo Capable     : yes
Burned In MAC     : 00:05:1E:76:42:00
Management IP     : 10.35.155.204
Status             : UP

  -- Power Supplies --
PS0 is OK
PS1 is OK

  -- Fan Status --
Fan 1 is Ok
Fan 2 is Ok
Fan 3 is Ok
```

**See Also**    **show version, show environment**

## show tech-support

Displays output for troubleshooting.

**Synopsis** show tech-support

**Operands** none

**Defaults** There are no default configurations for this command.

**Command Modes** Privileged EXEC mode

**Description** Use this command to run a script that automatically runs a variety of **show** commands with output that is useful to Technical Support for troubleshooting.

**Usage Guidelines** There are no usage guidelines for this command.

**Examples** To display output for troubleshooting:

```
switch#show tech-support

----- date -----
Thu Feb 19 18:30:13 UTC 2009

-----show version -----
Fabric Operating System Software
Fabric Operating System Version: 6.1
Copyright (c) 1995-2008 Brocade Communications Systems, Inc.
Build Time: 03:35:17 Feb 18, 2009
switch uptime: 04:11:09
Firmware name: v6.1.2

Switch Model Name: Brocade 8000
Control Processor: Freescale Semiconductor 8548E with 1016 MB of memory

4MB of boot flash memory.

 8 FC Port(s)
24 Ten GigabitEthernet/IEEE 802.3 interface(s)

----- show running-config -----
!
switch#
```

**See Also** none

## show users

Displays information on all users currently logged into the switch.

<b>Synopsis</b>	<b>show users</b>
<b>Operands</b>	none
<b>Defaults</b>	There are no default configurations for this command.
<b>Command Modes</b>	Privileged EXEC mode
<b>Description</b>	Use this command to view information on all users logged into the switch.
<b>Usage Guidelines</b>	There are no usage guidelines for this command.
<b>Examples</b>	To display information on users logged into the switch:

```
switch#show users
  Type      Idle      Location      User
* vty 0    00:00:00  172.21.252.244 root
```

Type	Displays the line numbers.
Idle	Displays how long the session has been idle.
Location	Displays the IP address of the user.
User	Displays the user name of all users logged in.

**See Also** [show line](#)

## show version

Displays version information for the hardware and software.

<b>Synopsis</b>	<b>show version</b>
<b>Operands</b>	none
<b>Defaults</b>	There are no default configurations for this command.
<b>Command Modes</b>	Privileged EXEC mode
<b>Description</b>	Use this command to display hardware and software version information.
<b>Usage Guidelines</b>	There are no usage guidelines for this command.
<b>Examples</b>	To display version information: <pre>switch#<b>show version</b> Fabric Operating System Software Fabric Operating System Version: 6.1 Copyright (c) 1995-2008 Brocade Communications Systems, Inc. Build Time: 03:35:17 Feb 18, 2009 E209 uptime: 04:14:43 Firmware name: v6.1.2  Switch Model Name: Brocade 8000 Control Processor: Freescale Semiconductor 8548E with 1016 MB of memory  4MB of boot flash memory.  8 FC Port(s) 24 Ten GigabitEthernet/IEEE 802.3 interface(s) switch#</pre>
<b>See Also</b>	<b>show system</b>



## terminal length

Sets the number of lines to display on a screen.

**Synopsis** `terminal length number`

**Operands** *number* Specifies the number of lines to display on a screen. The range of valid values is 0-512.

**Defaults** The default length is 24.

**Command Modes** Privileged EXEC mode

**Description** Use this command to set the number of lines to display on the screen.

**Usage Guidelines** If 0 (zero), the switch does not pause between screens of output.

**Examples** To set the number of lines to display on the screen to 30:

```
switch#terminal length 30
```

**See Also** none

## terminal monitor

Displays the RASlog and debug outputs on a terminal.

**Synopsis**    **terminal monitor**  
              **terminal no monitor**

**Operands**    none

**Defaults**    The terminal monitor option is disabled.

**Command Modes**    Privileged EXEC mode

**Description**    Use this command to enable or disable the display of the RASlog and debug outputs on a terminal.

**Usage Guidelines**    There are no usage guidelines for this command.

**Examples**    To enable the display of the RASlog and the debug outputs on a terminal:

```
switch#terminal monitor
```

To disable the display of the RASlog and the debug outputs on a terminal:

```
switch#terminal no monitor
```

**See Also**    none

## write erase

Removes the startup configuration from the switch.

**Synopsis**     **write erase**

**Operands**    none

**Defaults**    There are no default configurations for this command.

**Command Modes**   Privileged EXEC mode

**Description**    Use this command to remove a startup configuration.

**Usage Guidelines**   There are no usage guidelines for this command.

**Examples**       To clear a startup configuration:

```
switch#write erase
```

**See Also**       **write memory**

## write memory

Copies the current running configuration to the startup configuration file.

**Synopsis** write memory

**Operands** none

**Defaults** There are no default configurations for this command.

**Command Modes** Privileged EXEC mode

**Description** Use this command to copy the current running configuration to the startup configuration file.

**Usage Guidelines** There are no usage guidelines for this command.

**Examples** To write configuration data to a file:

```
switch#write memory
Overwrite the startup config file (y/n): y
Building configuration...
```

**See Also** write erase

# VLAN Commands

---

## fcf forward

Enables Fibre Channel over Ethernet (FCoE) on a VLAN interface.

<b>Synopsis</b>	<b>fcf forward</b> <b>no fcf forward</b>
<b>Operands</b>	none
<b>Defaults</b>	FCF forwarding is disabled.
<b>Command Modes</b>	Interface VLAN mode
<b>Description</b>	Use this command to enable FC forwarding on the VLAN interface in order to carry FCoE traffic. Use the <b>no fcf forward</b> command to disable FCoE on a VLAN.
<b>Usage Guidelines</b>	There are no usage guidelines for this command.
<b>Examples</b>	To enable FC forwarding on a VLAN interface: <pre>switch(config)#<b>interface</b> vlan 777 switch(conf-if-vl-777)#<b>fcf forward</b></pre>
<b>See Also</b>	<b>interface vlan</b>

## interface vlan

Configures a VLAN interface.

<b>Synopsis</b>	<b>interface vlan</b> <i>vlan_id</i> <b>no interface vlan</b> <i>vlan_id</i>
<b>Operands</b>	<i>vlan_id</i> Specifies the VLAN interface to configure. The range of valid values is 1-3583.
<b>Defaults</b>	VLAN 1 is predefined on the switch.
<b>Command Modes</b>	Global configuration mode
<b>Description</b>	Use this command to configure a VLAN interface. Use the <b>no interface vlan</b> <i>vlan_id</i> command to delete a VLAN interface.
<b>Usage Guidelines</b>	All of the ports on the switch are a part of the default VLAN 1.
<b>Examples</b>	To create a VLAN with ID 56: <pre>switch(config)#<b>interface vlan 56</b> switch-cmsh(conf-if-vl-56)#</pre>
<b>See Also</b>	<b>interface switchport, fcf forward, shutdown</b>

## show interface

Displays the configuration and status of an interface.

**Synopsis** `show interface [tengigabitethernet slot/port | port-channel number | switchport]`

**Operands** `tengigabitethernet`

Specifies a valid 10 Gbps Ethernet interface.

`slot` Specifies a valid slot number.

`port` Specifies a valid port number.

`port-channel number`

Specifies the interface is a port-channel. The range of valid values is 1-63.

`switchport`

Specifies the Layer 2 interface.

**Defaults** There are no default configurations for this command.

**Command Modes** EXEC mode

**Description** Use this command to show the running system status and configuration for a specified interface.

**Usage Guidelines** There are no usage guidelines for this command.

**Examples** To display information for a 10 Gbps Ethernet interface:

```
switch#show interface tengigabitethernet 0/1

Interface name       : TenGigabitEthernet 0/7
Switchport mode     : access
Ingress filter       : enable
Acceptable frame types : all
Default Vlan        : 1
Active Vlans        : 1
Inactive Vlans      : -

Interface name       : TenGigabitEthernet 0/1
Switchport mode     : access
Ingress filter       : enable
Acceptable frame types : all
Default Vlan        : 5
Active Vlans        : 5
Inactive Vlans      : -
```

**See Also** `show interface vlan`

## show vlan

Displays information about a specific VLAN interface.

**Synopsis** `show vlan {vlan_id | brief | classifier | fcoe}`

**Operands**

<code>vlan_id</code>	Specifies the VLAN interface to display. The range of valid values is 1-3583.
<code>brief</code>	Specifies to display VLAN information for all interfaces including static and dynamic.
<code>classifier</code>	Specifies to display all VLAN classification information.
<code>fcoe</code>	Specifies to display all FCoE VLAN interfaces.

**Defaults** There are no default configurations for this command.

**Command Modes** Privileged EXEC mode

**Description** Use this command to display information about VLAN.

**Usage Guidelines** There are no usage guidelines for this command.

**Examples** To show information on a VLAN:

```
switch#show vlan 1
VLAN      Name                State  Ports
                                     (u)-Untagged, (t)-Tagged
                                     (c)-Converged
=====
1         default            ACTIVE Te 0/0(t) Te 0/4(t) Te 0/5(t)
                                     Te 0/8(t) Te 0/10(t) Te 0/11(c)
                                     Po 1(t) Po 63(t)
```

**See Also** none



## show vlan classifier

Displays information about a specific VLAN classifier group.

<b>Synopsis</b>	<b>show vlan classifier</b> [ <b>group</b> <i>number</i>   <b>interface</b> <i>group number</i>   <b>port-channel</b> <i>number</i>   <b>rule</b> <i>number</i>   <b>tengigabitethernet</b> <i>slot/port</i>   <b>vlan</b> <i>vlan_id</i> ]	
<b>Operands</b>	<b>group</b> <i>number</i>	Specifies the VLAN classifier group number. The range of valid values is 1-16.
	<b>interface</b> <i>group number</i>	Specifies the VLAN classifier interface group number. The range of valid values is 1-16.
	<b>port-channel</b> <i>number</i>	Specifies the VLAN classifier port-channel number. The range of valid values is 1-63.
	<b>rule</b> <i>number</i>	Specifies the VLAN classifier rule number. The range of valid values is 1-256.
	<b>tengigabitethernet</b>	Specifies a valid 10 Gbps Ethernet interface.
	<i>slot</i>	Specifies a valid slot number.
	<i>port</i>	Specifies a valid port number
	<b>vlan</b> <i>vlan_id</i>	Specifies the VLAN to display. The range of valid values is 1-3583.
<b>Defaults</b>	There are no default configurations for this command.	
<b>Command Modes</b>	EXEC mode	
<b>Description</b>	Use this command to display information about all configured VLAN classifier groups or a specific VLAN interface group.	
<b>Usage Guidelines</b>	If a group ID is not specified, all configured VLAN classifier groups are shown. If a group ID is specified, a specific configured VLAN classifier group is shown.	
<b>Examples</b>	To display the VLAN classifier for group 1:	
	<pre>switch#show vlan classifier group 1 vlan classifier group 1 rule 1</pre>	
<b>See Also</b>	none	

## switchport

Puts the interface to Layer 2 mode and sets the switching characteristics of the Layer 2 interface to the defaults.

<b>Synopsis</b>	<b>switchport</b> <b>no switchport</b>
<b>Operands</b>	none
<b>Defaults</b>	By default, all Layer 2 interfaces are mapped to default VLAN 1 and the interface is set to access mode.
<b>Command Modes</b>	Interface configuration mode
<b>Description</b>	Use this command to set the switching characteristics of the Layer 2 interface. Use the <b>no switchport</b> command to take the switch out of the Layer 2 mode.
<b>Usage Guidelines</b>	For changing the interface configuration mode to trunk or changing the default VLAN mapping, use additional <b>switchport</b> commands.
<b>Examples</b>	To put an interface in Layer 2 mode: <pre>switch(conf-if-te-0/1)#<b>switchport</b></pre> To remove an interface from Layer 2 mode: <pre>switch(conf-if-te-0/1)#<b>no switchport</b></pre>
<b>See Also</b>	<b>show vlan brief, show interface switchport, switchport mode, switchport access, switchport trunk</b>

## switchport access

Sets the Layer 2 interface as access.

<b>Synopsis</b>	<b>switchport access vlan</b> <i>vlan_id</i> <b>no switchport access vlan</b>
<b>Operands</b>	<b>vlan</b> <i>vlan_id</i> Sets the port VLAN (PVID) to the specified <i>vlan_id</i> . The range of valid values is 1-3583.
<b>Defaults</b>	By default, all Layer 2 interfaces are in access mode and belong to the VLAN ID 1.
<b>Command Modes</b>	Interface configuration mode
<b>Description</b>	Use this command to set the Layer 2 interface as access. In access mode, the interface only allows untagged and priority tagged packets. Use the <b>no switchport access vlan</b> command to set the PVID to the default VLAN 1.
<b>Usage Guidelines</b>	There are no usage guidelines for this command.
<b>Examples</b>	To set the Layer 2 interface PVID to 100: <pre>switch(conf-if-te-0/19)#switchport access vlan 100</pre>
<b>See Also</b>	<b>show vlan brief, show interface switchport, switchport mode, switchport trunk</b>

## switchport converged

Adds or removes native and tagged VLANs on a Layer 2 interface.

<b>Synopsis</b>	<b>switchport converged</b> { <b>vlan</b> <i>vlan_id</i>   <b>allowed vlan</b> { <b>add</b> <i>vlan_id</i>   <b>all</b>   <b>except</b> <i>vlan_id</i>   <b>none</b>   <b>remove</b> <i>vlan_id</i> } }	
	<b>no switchport converged</b>	
<b>Operands</b>	<b>vlan</b> <i>vlan_id</i>	Sets the default native VLAN for the Layer 2 interface.
	<b>allowed vlan</b>	Sets the VLANs that will transmit and receive through the Layer 2 interface.
	<b>add</b> <i>vlan_id</i>	Adds a VLAN to transmit and receive through the Layer2 interface. The range of valid values is 2-3583.
	<b>all</b>	Allows all VLANs to transmit and receive through the Layer 2 interface.
	<b>except</b> <i>vlan_id</i>	Allows all VLANs except the VLAN ID to transmit and receive through the Layer 2 interface. The range of valid values is 2-3583.
	<b>none</b>	Allows no VLANs to transmit and receive through the Layer 2 interface.
	<b>remove</b> <i>vlan_id</i>	Removes a VLAN that transmits and receives through the Layer 2 interface. The range of valid values is 2-3583.
<b>Defaults</b>	The default native VLAN for a converged interface is 1.	
<b>Command Modes</b>	Interface configuration mode	
<b>Description</b>	Use this command to add or remove tagged VLANs on a Layer 2 interface.	
<b>Usage Guidelines</b>	There are no usage guidelines for this command.	
<b>Examples</b>	To set the native VLAN of 200 on an interface: <pre>switch(conf-if-te-0/19)#switchport converged vlan 200</pre>	
	To set the tagged VLAN on an interface to 100: <pre>switch(conf-if-te-0/19)#switchport converged allowed vlan add 100</pre>	
	To remove the tagged VLAN 100 from the interface: <pre>switch(conf-if-te-0/19)#switchport converged allowed vlan remove 100</pre>	
<b>See Also</b>	<b>show vlan brief, show interface switchport, switchport mode, switchport trunk</b>	

## switchport mode

Sets the mode of the Layer 2 interface.

<b>Synopsis</b>	<b>switchport mode {access   trunk   converged}</b>
<b>Operands</b>	<b>access</b> Sets the Layer 2 interface as access. <b>trunk</b> Sets the Layer 2 interface as trunk. <b>converged</b> Sets the layer 2 interface as converged.
<b>Defaults</b>	There are no defaults for this command.
<b>Command Modes</b>	Interface configuration mode
<b>Description</b>	Use this command to set the mode of the Layer 2 interface.
<b>Usage Guidelines</b>	There are no usage guidelines for this command.
<b>Examples</b>	To set the mode of the interface to access: <pre>switch(conf-if-te-0/19)#switchport mode access</pre> To set the mode of the interface to trunk: <pre>switch(conf-if-te-0/19)#switchport mode trunk</pre> To set the mode of the interface to converged: <pre>switch(conf-if-te-0/19)#switchport mode converged</pre>
<b>See Also</b>	<b>show vlan brief, show interface switchport, switchport trunk</b>

## switchport trunk

Adds or removes tagged VLANs on a Layer 2 interface.

<b>Synopsis</b>	<b>switchport trunk allowed vlan</b> { <b>add</b> <i>vlan_id</i>   <b>all</b>   <b>except</b> <i>vlan_id</i>   <b>none</b>   <b>remove</b> <i>vlan_id</i> }												
	<b>no switchport trunk</b>												
<b>Operands</b>	<table border="0"> <tr> <td style="vertical-align: top;"><b>allowed vlan</b></td> <td>Sets the VLANs that will transmit and receive through the Layer 2 interface.</td> </tr> <tr> <td style="vertical-align: top;"><b>add</b> <i>vlan_id</i></td> <td>Adds a VLAN to transmit and receive through the Layer2 interface. The range of valid values is 2-3583.</td> </tr> <tr> <td style="vertical-align: top;"><b>all</b></td> <td>Allows all VLANs to transmit and receive through the Layer 2 interface.</td> </tr> <tr> <td style="vertical-align: top;"><b>except</b> <i>vlan_id</i></td> <td>Allows all VLANs except the VLAN ID to transmit and receive through the Layer 2 interface. The range of valid values is 2-3583.</td> </tr> <tr> <td style="vertical-align: top;"><b>none</b></td> <td>Allows no VLANs to transmit and receive through the Layer 2 interface.</td> </tr> <tr> <td style="vertical-align: top;"><b>remove</b> <i>vlan_id</i></td> <td>Removes a VLAN that transmits and receives through the Layer 2 interface. The range of valid values is 2-3583.</td> </tr> </table>	<b>allowed vlan</b>	Sets the VLANs that will transmit and receive through the Layer 2 interface.	<b>add</b> <i>vlan_id</i>	Adds a VLAN to transmit and receive through the Layer2 interface. The range of valid values is 2-3583.	<b>all</b>	Allows all VLANs to transmit and receive through the Layer 2 interface.	<b>except</b> <i>vlan_id</i>	Allows all VLANs except the VLAN ID to transmit and receive through the Layer 2 interface. The range of valid values is 2-3583.	<b>none</b>	Allows no VLANs to transmit and receive through the Layer 2 interface.	<b>remove</b> <i>vlan_id</i>	Removes a VLAN that transmits and receives through the Layer 2 interface. The range of valid values is 2-3583.
<b>allowed vlan</b>	Sets the VLANs that will transmit and receive through the Layer 2 interface.												
<b>add</b> <i>vlan_id</i>	Adds a VLAN to transmit and receive through the Layer2 interface. The range of valid values is 2-3583.												
<b>all</b>	Allows all VLANs to transmit and receive through the Layer 2 interface.												
<b>except</b> <i>vlan_id</i>	Allows all VLANs except the VLAN ID to transmit and receive through the Layer 2 interface. The range of valid values is 2-3583.												
<b>none</b>	Allows no VLANs to transmit and receive through the Layer 2 interface.												
<b>remove</b> <i>vlan_id</i>	Removes a VLAN that transmits and receives through the Layer 2 interface. The range of valid values is 2-3583.												
<b>Defaults</b>	There are no default configurations for this command.												
<b>Command Modes</b>	Interface configuration mode												
<b>Description</b>	Use this command to add or remove tagged VLANs on a Layer 2 interface.												
<b>Usage Guidelines</b>	There are no usage guidelines for this command.												
<b>Examples</b>	<p>To set the tagged VLAN on an interface to 100:</p> <pre>switch(conf-if-te-0/19)#switchport truck allowed vlan add 100</pre> <p>To remove the tagged VLAN 100 from the interface:</p> <pre>switch(conf-if-te-0/19)#switchport truck allowed vlan remove 100</pre>												
<b>See Also</b>	<b>show vlan brief, show interface switchport, switchport mode, switchport trunk</b>												

## vlan classifier activate group

Activates a VLAN classifier group.

<b>Synopsis</b>	<b>vlan classifier activate group</b> <i>number</i> <b>vlan</b> <i>vlan_id</i> <b>no vlan classifier activate group</b>
<b>Operands</b>	<i>number</i> Specifies which VLAN classifier group to activate. The range of valid values is 1-16. <b>vlan</b> <i>vlan_id</i> Specifies which VLAN interface to activate. The range of valid values is 1-3583.
<b>Defaults</b>	There are no default configurations for this command.
<b>Command Modes</b>	Interface configuration mode
<b>Description</b>	Use this command to activate a VLAN classifier group for a specified VLAN. Use the <b>no vlan classifier activate group</b> command to remove the specified group.
<b>Usage Guidelines</b>	There are no usage guidelines for this command.
<b>Examples</b>	To activate VLAN classifier group 1 for VLAN 5: <pre>switch-cmsh(conf-if-te-0/10)#vlan classifier activate group 1 vlan 5</pre>
<b>See Also</b>	none

## vlan classifier group

Adds and deletes rules to a VLAN classifier group.

**Synopsis** `vlan classifier group number [add rule number] delete rule number]`  
`no vlan classifier group`

**Operands** *number* Specifies the VLAN group number for which rules are to be added or deleted. The range of valid values is 1-16.  
**add rule *number*** Specifies a rule is to be added. The range of valid values is 1-256.  
**delete rule *number*** Specifies a rule is to be deleted. The range of valid values is 1-256.

**Defaults** There are no default configurations for this command.

**Command Modes** Global configuration mode

**Description** Use this command to add and delete rules from VLAN classifier groups.

**Usage Guidelines** There are no usage guidelines for this command.

**Examples** To add rule 1 to VLAN classifier group 1:  

```
switch(config)#vlan classifier group 1 add rule 1
```

**See Also** none



## vlan classifier rule

Creates a VLAN classifier rule.

<b>Synopsis</b>	<b>vlan classifier rule</b> <i>rule_id</i> [ <b>mac</b> <i>mac_address</i> ] [ <b>proto</b>   <b>arp</b>   <b>fcoe</b>   <b>fip</b> ] [ <b>encap</b> <b>ethv2</b>   <b>nosnapllc</b>   <b>snapllc</b> ]
	<b>no vlan classifier rule</b>
<b>Operands</b>	<p><i>rule_id</i> Specifies the VLAN identification rule. The range of valid values is 1-255.</p> <p><b>mac</b> Specifies the Media Access Control (MAC) list.</p> <p><i>mac_address</i> Specifies the MAC address-based VLAN classifier rule used to map to a specific VLAN.</p> <p><b>proto</b> Specifies the protocol to use for the VLAN classifier rule.</p> <p><b>arp</b> Specifies to use the Address Resolution Protocol.</p> <p><b>fcoe</b> Specifies to use the Fibre Channel over Ethernet Protocol.</p> <p><b>fip</b> Specifies to use the FCoE Initialization Protocol.</p> <p><b>encap</b> Specifies to encapsulate the Ethernet frames sent for the VLAN classifier rule.</p> <p><b>ethv2</b> Specifies to use the Ethernet version 2 encapsulated frames.</p> <p><b>nosnapllc</b> Specifies to use the Ethernet version 2 non-SNA frames.</p> <p><b>snapllc</b> Specifies to use the Ethernet version 2 with SNA frames.</p>
<b>Defaults</b>	There are no default configurations for this command.
<b>Command Modes</b>	Global configuration mode
<b>Description</b>	Use this command to configure a VLAN classifier rule to dynamically classify Ethernet packets on an untagged interface into VLANs. Use the <b>no vlan classifier rule</b> command to delete the VLAN classifier rule specified by the <i>rule_id</i> .
<b>Usage Guidelines</b>	VLAN classifiers can be created individually and can be managed separately. Up to 256 VLAN classifiers can be provisioned. One or more VLAN classifiers can be grouped into a classifier group. This classifier group can further be applied on an interface.
<b>Examples</b>	<p>To create an fcoe VLAN classifier rule:</p> <pre>switch(config)#vlan classifier rule 2 proto fcoe encap ethv2</pre> <p>To create a MAC-based VLAN classifier rule:</p> <pre>switch(config)#vlan classifier rule 2 mac 0000.0000.0100</pre>
<b>See Also</b>	<b>show vlan interface</b>

### 3 vlan classifier rule

# Interface Commands

---

## clear counters

Clears statistics on all interfaces on the switch.

**Synopsis** `clear counters {all | access-list mac access_list_name | [interface port-channel number | tengigabitethernet slot/port | slot-id number] }`

**Operands**

- all** Specifies to clear statistics on all interfaces.
- access-list mac *access\_list\_name***  
Specifies the name of the MAC access list.
- interface** Use this keyword to specify any of the following interfaces:
  - port-channel *number***  
Specifies the port-channel number. The range of valid values is 1-63.
  - tengigabitethernet**  
Specifies a valid 10 Gbps Ethernet interface.
  - slot*** Specifies a valid slot number.
  - port*** Specifies a valid port number.
  - slot-id *number*** Specifies the slot number of the linecard. For the Brocade 8000 switch, the slot number is always 0 (zero).

**Description** Use this command to clear statistics on one or on all interfaces.

**Defaults** There are no default configurations for this command.

**Command Modes** Privileged EXEC mode

**User Guidelines** The **clear counters all** command does not clear counters for any of the protocol daemon stats like LLDP, LACP, MSTP, and so on.

**Example** To clear the statistics for 10 Gbps Ethernet interface 0/1:

```
switch#clear counters interface tengigabitethernet 0/1
```

To clear the statistics for MAC access list named "test":

```
switch#clear counters access-list mac test
```

To clear the statistics for all the interfaces on the linecard in slot 0 (zero):

```
switch#clear counters slot-id 0
```

**4** clear counters

**See Also** show interfaces

## description

Specifies a string that contains the description of the interface.

<b>Synopsis</b>	<b>description</b> <i>line</i> <b>no description</b>
<b>Operands</b>	<i>line</i> Specifies characters describing the interface. The maximum number of characters is 64.
<b>Defaults</b>	There are no default configurations for this command.
<b>Command Modes</b>	Interface configuration mode
<b>Description</b>	Use this command to specify a string that contains the description of the interface. Use the <b>no description</b> command to remove the description.
<b>Usage Guidelines</b>	There are no usage guidelines for this command.
<b>Examples</b>	To set the string describing tengigabitethernet interface 0/1: <pre>switch(conf-if-te-0/1)#<b>description converged_101</b></pre>
<b>See Also</b>	<b>none</b>

## interface

Enters the interface configuration mode to configure an interface.

**Synopsis** **interface** [**port-channel** *number* | **tengigabitethernet** *slot/port* | **vlan** *vlan id*]  
**no interface** [**port-channel** *number* | **vlan** *vlan id*]

**Operands** **tengigabitethernet** Configures the specified 10 Gbps Ethernet interface.  
*slot* Specifies a valid slot number.  
*port* Specifies a valid port number.  
**port-channel** *number* Specifies the port-channel number. The range of valid values is 1-63.  
**vlan** *vlan\_id* Specifies the VLAN number. The range of valid values is 1-3583.

**Defaults** There are no default configurations for this command.

**Command Modes** Global configuration mode

**Description** Use this command to create or enter the interface configuration mode to configure an interface.

**Usage Guidelines** There are no usage guidelines for this command.

**Examples** none

**See Also** **show interface, interface vlan**

## mtu

Specifies the MTU on the interface.

**Synopsis**     **mtu size**

**Operands**    **size**                   Specifies the size of the maximum transmission unit (MTU) of an interface.  
The allowed MTU size is 1522-9208 bytes.

**Defaults**     By default, all 10 Gbps Ethernet interfaces use a default MTU of 2500 bytes.

**Command Modes**   Interface configuration mode

**Description**     Use this command to specify the MTU on the interface.

**Usage Guidelines**   Creating MTUs under VLAN interfaces is not valid.

**Examples**        none

**See Also**        none

## show interface

<b>Synopsis</b>	<b>show interface</b> [ <b>port-channel</b> <i>number</i>   <b>tengigabitethernet</b> <i>slot/port</i>   <b>switchport</b> ]
<b>Operands</b>	<p><b>port-channel</b> <i>number</i> Specifies to display the port-channel number. The range of valid values is 1-63.</p> <p><b>tengigabitethernet</b> Specifies to display a specific 10 Gbps Ethernet interface.</p> <p style="padding-left: 2em;"><i>slot</i> Specifies to display a valid slot number.</p> <p style="padding-left: 2em;"><i>port</i> Specifies to display a valid port number.</p> <p><b>switchport</b> Specifies to display information for Layer 2 interfaces.</p>
<b>Defaults</b>	There are no default configurations for this command.
<b>Command Modes</b>	EXEC mode
<b>Description</b>	Use this command to display the detailed interface configuration and capabilities of all interfaces or for a specific interface.
<b>Usage Guidelines</b>	There are no usage guidelines for this command.
<b>Examples</b>	<p>To display detailed information for 10 Gbps Ethernet interface 0/1:</p> <pre> switch#show interface tengigabitethernet 0/1 TenGigabitEthernet 0/1 is admin down, line protocol is down (admin down) Hardware is Ethernet, address is 0005.1e76.1aa5   Current address is 0005.1e76.1aa5 Pluggable media present, Media type is sfp   Wavelength is 850 nm Interface index (ifindex) is 67174401 MTU 2500 bytes LineSpeed: 10000 Mbit, Duplex: Full Flowcontrol rx: on, tx: on Last clearing of show interface counters: 00:02:18 Queueing strategy: fifo Receive Statistics:   0 packets, 0 bytes   Unicasts: 0, Multicasts: 0, Broadcasts: 0   64-byte pkts: 0, Over 64-byte pkts: 0, Over 127-byte pkts: 0   Over 255-byte pkts: 0, Over 511-byte pkts: 0, Over 1023-byte pkts: 0   Over 1518-byte pkts(Jumbo): 0   Runts: 0, Jabbers: 0, CRC: 0, Overruns: 0   Errors: 0, Discards: 0 Transmit Statistics:   0 packets, 0 bytes   Unicasts: 0, Multicasts: 0, Broadcasts: 0   Underruns: 0   Errors: 0, Discards: 0 Rate info (interval 299 seconds):   Input 0.000000 Mbits/sec, 0 packets/sec, 0.00% of line-rate   Output 0.000000 Mbits/sec, 0 packets/sec, 0.00% of line-rate </pre>



Time since last interface status change: 00:02:17

To display Layer 2 information for all interfaces:

```
switch#show interface switchport
```

```
Interface name       : TenGigabitEthernet 0/8
Switchport mode     : access
Ingress filter       : enable
Acceptable frame types : all
Default Vlan        : 1
Active Vlans         : 1
Inactive Vlans       : -
```

```
Interface name       : TenGigabitEthernet 0/19
Switchport mode     : hybrid
Ingress filter       : enable
Acceptable frame types : all
Default Vlan        : 1
Active Vlans         : 1
Inactive Vlans       : 100
```

```
Interface name       : TenGigabitEthernet 0/20
Switchport mode     : trunk
Ingress filter       : enable
Acceptable frame types : vlan-tagged only
Default Vlan        : 0
Active Vlans         : 1
Inactive Vlans       : -
```

**See Also**    **show ip interface**

## show ip interface

Displays the IP interface status and configuration of all interfaces or a specified interface.

<b>Synopsis</b>	<b>show ip interface</b> { <b>brief</b>   <b>port-channel</b> <i>number</i> <b>brief</b>   <b>tengigabitethernet</b> <i>slot/port</i> <b>brief</b>   <b>vlan</b> <i>vlan_id</i> <b>brief</b> }
<b>Operands</b>	<p><b>brief</b> Specifies to display a brief summary of the IP status and configuration.</p> <p><b>port-channel</b> <i>number</i> Specifies to display the port-channel number. The range of valid values is 1-63.</p> <p><b>tengigabitethernet</b> Specifies to display a specific 10 Gbps Ethernet interface.</p> <p><i>slot</i> Specifies to display a valid slot number.</p> <p><i>port</i> Specifies to display a valid port number.</p> <p><b>vlan</b> <i>vlan_id</i> Specifies to display a the VLAN number. The range of valid values is 1-3583.</p>
<b>Defaults</b>	There are no default configurations for this command.
<b>Command Modes</b>	EXEC mode
<b>Description</b>	Use this command to display IP interface status and configuration of all interfaces or a specified interface.
<b>Usage Guidelines</b>	There are no usage guidelines for the command.
<b>Examples</b>	To display information about all of the interfaces in the summary format:

```

switch#show ip interface brief
Interface          IP-Address      Status          Protocol
=====          =
Port-channel 10    unassigned     up              down
Port-channel 11    unassigned     up              down
Port-channel 12    unassigned     up              down
Port-channel 13    unassigned     up              up
Port-channel 14    unassigned     up              down
Port-channel 15    unassigned     up              up
TenGigabitEthernet 0/0    unassigned     up              up
TenGigabitEthernet 0/1    unassigned     up              down
TenGigabitEthernet 0/2    unassigned     up              up
TenGigabitEthernet 0/3    unassigned     up              up
TenGigabitEthernet 0/4    unassigned     up              down
TenGigabitEthernet 0/5    unassigned     up              down
TenGigabitEthernet 0/6    unassigned     up              down
TenGigabitEthernet 0/7    unassigned     up              up
TenGigabitEthernet 0/8    unassigned     up              up
TenGigabitEthernet 0/9    unassigned     up              up
TenGigabitEthernet 0/10   unassigned     up              down
TenGigabitEthernet 0/11   unassigned     up              down
TenGigabitEthernet 0/12   unassigned     up              up

```

```
TenGigabitEthernet 0/13  unassigned  up  up
TenGigabitEthernet 0/14  unassigned  up  down
TenGigabitEthernet 0/15  unassigned  up  up
TenGigabitEthernet 0/16  unassigned  up  down
TenGigabitEthernet 0/17  unassigned  up  up
TenGigabitEthernet 0/18  unassigned  up  down
TenGigabitEthernet 0/19  unassigned  up  up
TenGigabitEthernet 0/20  unassigned  up  up
TenGigabitEthernet 0/21  unassigned  up  up
TenGigabitEthernet 0/22  unassigned  up  up
TenGigabitEthernet 0/23  unassigned  up  up
Vlan 1                  unassigned  administratively down  down
Vlan 100                unassigned  administratively down  down
Vlan 200                unassigned  administratively down  down
```

**See Also**    **show interface**

## shutdown

Disables the selected interface.

**Synopsis**    **shutdown**  
              **no shutdown**

**Operands**    none

**Defaults**    The interface is disabled.

**Command Modes**    Interface configuration mode

**Description**    Use this command to disable an interface.

**Usage Guidelines**    There are no usage guidelines for this command.

**Examples**    To disable an interface:  
                  switch(conf-if-te-0/1)#**shutdown**

To enable an interface:  
                  switch(conf-if-te-0/1)#**no shutdown**

**See Also**    **interface, show ip interface, show interface**

# Link Layer Discovery Protocol Commands

---

## advertise dcbx-fcoe-app-tlv

Advertises application Type, Length, Values (TLVs) to ensure interoperability of traffic over the Data Center Bridging eXchange protocol (DCBX), which runs over LLDP to negotiate an FCoE application TLV.

<b>Synopsis</b>	<b>advertise dcbx-fcoe-app-tlv</b> <b>no advertise dcbx-fcoe-app-tlv</b>
<b>Operands</b>	none
<b>Defaults</b>	Advertise is disabled.
<b>Command Modes</b>	Protocol LLDP configuration mode
<b>Description</b>	Use this command to advertise application TLVs to ensure interoperability of traffic over DCBX packets. Converged Enhanced Ethernet (CEE) parameters related to FCoE must be negotiated before FCoE traffic can begin on a CEE link. An FCoE application TLV is exchanged over the LLDP protocol, which negotiates information such as FCoE priority, and Priority Flow Control (PFC) pause. Use the <b>no advertise dcbx-fcoe-app-tlv</b> command to return to the default setting.
<b>Usage Guidelines</b>	There are no usage guidelines for this command.
<b>Examples</b>	none
<b>See Also</b>	<b>advertise dot1-tlv, advertise dot3-tlv, advertise optional-tlv</b>

## advertise dcbx-fcoe-logical-link-tlv

Advertises to any attached device the FCoE status of the logical link.

**Synopsis**     **advertise dcbx-fcoe-logical-link-tlv**  
              **no advertise dcbx-fcoe-logical-link-tlv**

**Operands**    none

**Defaults**    Advertise is disabled.

**Command Modes**   Protocol LLDP configuration mode

**Description**     Use this command to advertise to any attached device the FCoE status of the logical link. Use the **no advertise dcbx-fcoe-logical-link-tlv** command to return to the default setting.

**Usage Guidelines**   There are no usage guidelines for this command.

**Examples**        none

**See Also**        **advertise dcbx-fcoe-app-tlv, advertise dcbx fcoe-app-tlv**

## advertise dcbx-tlv

Advertises to any attached device mandatory Data Center Bridging eXchange protocol (DCBX) Type, Length, Values (TLVs).

<b>Synopsis</b>	<b>advertise dcbx-tlv</b> <b>no advertise dcbx-tlv</b>
<b>Operands</b>	none
<b>Defaults</b>	Advertise is enabled.
<b>Command Modes</b>	Protocol LLDP configuration mode
<b>Description</b>	Advertises to any attached device mandatory Data Center Bridging eXchange protocol (DCBX) Type, Length, Values (TLVs). Use the <b>no advertise dcbx-tlv</b> command to return to the default setting.
<b>Usage Guidelines</b>	There are no usage guidelines for this command.
<b>Examples</b>	none
<b>See Also</b>	<b>advertise dot1-tlv, advertise dot3-tlv, advertise optional-tlv</b>

## advertise dot1-tlv

Advertises to any attached device IEEE 802.1 organizationally specific Type, Length, Value (TLV).

<b>Synopsis</b>	<b>advertise dot1-tlv</b> <b>no advertise dot1-tlv</b>
<b>Operands</b>	none
<b>Defaults</b>	Advertise is disabled.
<b>Command Modes</b>	Protocol LLDP configuration mode
<b>Description</b>	Use this command to advertise to any attached device IEEE 802.1 organizationally specific Type, Length, Value (TLV). Use the <b>no advertise dot1-tlv</b> command to return to the default setting.
<b>Usage Guidelines</b>	There are no usage guidelines for this command.
<b>Examples</b>	none
<b>See Also</b>	<b>advertise dot3-tlv, advertise dcbx-tlv, advertise optional-tlv</b>



## advertise dot3-tlv

Advertises to any attached device IEEE 802.3 organizationally specific Type, Length, Value (TLV).

<b>Synopsis</b>	<b>advertise dot3-tlv</b> <b>no advertise dot3-tlv</b>
<b>Operands</b>	none
<b>Defaults</b>	Advertise is disabled.
<b>Command Modes</b>	Protocol LLDP configuration mode
<b>Description</b>	Use this command to advertise to any attached device IEEE 802.3 organizationally specific Type, Length, Value (TLV). Use the <b>no advertise dot3-tlv</b> command to return to the default setting.
<b>Usage Guidelines</b>	There are no usage guidelines for this command.
<b>Examples</b>	none
<b>See Also</b>	<b>advertise dot1-tlv, advertise dcbx-tlv, advertise optional-tlv</b>

## advertise optional-tlv

Advertises the optional Type, Length, and Value (TLV)s.

<b>Synopsis</b>	<b>advertise optional-tlv</b> [ <b>management-address</b>   <b>port-description</b>   <b>system-capabilities</b>   <b>system-description</b>   <b>system-name</b> ] <b>no advertise optional-tlv</b>
<b>Operands</b>	<b>management-address</b> Specifies the management address of the system. <b>port-description</b> Describes the user configured port. <b>system-capabilities</b> Specifies the capabilities of the system. <b>system-description</b> Describes the system firmware version and the current image running on the system. <b>system-name</b> Specifies the name of the system.
<b>Defaults</b>	Advertise is disabled.
<b>Command Modes</b>	Protocol LLDP configuration mode
<b>Description</b>	Use this command to display the following optional TLVs. Use the <b>no advertise optional-tlv</b> command to return to the default setting.
<b>Usage Guidelines</b>	There are no usage guidelines for this command.
<b>Examples</b>	none

## clear lldp neighbors

Clears the Link Layer Discovery Protocol (LLDP) neighbor information on all or specified interfaces.

<b>Synopsis</b>	<b>clear lldp neighbors interface</b> [ <b>tengigabitethernet slot/port</b> ]
<b>Operands</b>	<b>interface</b> Use this keyword to specify the 10 Gbps Ethernet interface using the following operand followed by the slot or port number. <b>tengigabitethernet</b> Specifies a valid 10 Gbps Ethernet interface for which to clear the LLDP neighbor information. <b>slot</b> Specifies a valid slot number. <b>port</b> Specifies a valid port number.
<b>Defaults</b>	There are no default configurations for this command.
<b>Command Modes</b>	Privileged EXEC mode
<b>Description</b>	Use this command to clear the LLDP neighbor information about the devices learned through an interface.
<b>Usage Guidelines</b>	If the <b>interface</b> operand is not specified, this command clears the LLDP neighbor information received on all the interfaces.
<b>Examples</b>	To clear the LLDP information for all interfaces: <pre>switch#clear lldp neighbors</pre>
<b>See Also</b>	<b>show lldp neighbors</b>

## clear lldp statistics

Clears LLDP statistics for all interfaces or a specified interface.

**Synopsis** `clear lldp statistics interface [tengigabitethernet slot/port]`

**Operands** **interface** Use this keyword to specify the 10 Gbps Ethernet interface using the following operand followed by the slot or port number.

**tengigabitethernet**

Specifies a valid 10 Gbps Ethernet interface for which to clear the LLDP statistics.

*slot* Specifies a valid slot number.

*port* Specifies a valid port number.

**Defaults** There are no default configurations for this command.

**Command Modes** Privileged EXEC mode

**Description** Use this command to clear LLDP statistics for all interfaces or a specified interface.

**Usage Guidelines** If the **interface** operand is not specified, this command clears all the LLDP statistics on all interfaces.

**Examples** To clear all the LLDP statistics for all interfaces:

```
switch#clear lldp statistics
```

**See Also** `show lldp statistics`

## debug lldp packet

Enables debugging for Link Layer Discovery Protocol (LLDP).

<b>Synopsis</b>	<code>debug lldp packet {all   interface tengigabitethernet slot/port} [both   detail [both   rx   tx]   rx   tx]</code> <code>no debug lldp packet { all   interface tengigabitethernet slot/port }</code>
<b>Operands</b>	<p><b>all</b> Turns on LLDP packet debugging on all interfaces.</p> <p><b>interface tengigabitethernet</b> Specifies the 10 Gbps Ethernet interface.</p> <p><i>slot</i> Specifies the slot number.</p> <p><i>port</i> Specifies the port number.</p> <p><b>both</b> Turns on debugging for both transmit and receive packets.</p> <p><b>detail</b> Turns on debugging with detailed information.</p> <p><b>rx</b> Turns on debugging for only received LLDP packets.</p> <p><b>tx</b> Turns on debugging for only transmitted LLDP packets.</p>
<b>Defaults</b>	By default, debugging is not turned on.
<b>Command Modes</b>	Privileged EXEC mode
<b>Description</b>	Use this command to enable debugging for Link Layer Discovery Protocol (LLDP). Use the <b>no debug lldp packet</b> command to disable debugging.
<b>Usage Guidelines</b>	To display debugging outputs on a particular csh session, use the <b>terminal monitor</b> command.
<b>Examples</b>	<p>To enable debugging of LLDP for both received and transmitted packets on 10 Gbps Ethernet interface 0/1:</p> <pre>switch#debug lldp packet interface tengigabitethernet 0/1 both switch#show debug lldp LLDP debugging status: Interface te0/1      : Transmit Receive</pre>
<b>See Also</b>	<b>show debug lldp</b>

## description

Specifies a string that contains the description of the LLDP.

**Synopsis**     **description** *line*  
              **no description**

**Operands**    line                    Characters describing the LLDP protocol.

**Defaults**    There are no default configurations for this command.

**Command Modes**   Protocol LLDP configuration mode

**Description**     Use this command to specify a string that contains the description of the LLDP. Use the **no description** command to remove the description.

**Usage Guidelines**   There are no usage guidelines for this command.

**Examples**        To set the strings describing LLDP:  
                  switch(conf-lldp)#**description Brocade-LLDP**

**See Also**        **none**

## hello

Sets the Hello transmit interval.

<b>Synopsis</b>	<b>hello</b> <i>seconds</i> <b>no hello</b>
<b>Operands</b>	<i>seconds</i> Sets the Hello transmit interval. The range of valid values is 4-180 seconds.
<b>Defaults</b>	The default is 30 seconds.
<b>Command Modes</b>	Protocol LLDP configuration mode
<b>Description</b>	Use this command to set the interval between LLDP hello messages. Use the <b>no hello</b> command to return to the default setting.
<b>Usage Guidelines</b>	There are no usage guidelines for this command.
<b>Examples</b>	To set the time interval to 10 seconds between the transmissions: <pre>switch#<b>configure terminal</b> switch (config) #<b>protocol lldp</b> switch(conf-lldp) #<b>hello 10</b></pre>
<b>See Also</b>	<b>none</b>

## lldp dcbx-version

Specifies which version of the Data Center Bridging Exchange (DCBX) protocol to use.

**Synopsis** `lldp dcbx-version [auto | cee | pre-cee]`

<b>Operands</b>	<b>auto</b>	Specifies to auto adjust the DCBX protocol version to accommodate the difference when a switch interacts with different vendors using a different version of the DCBX protocol.
	<b>cee</b>	Specifies to use the Converged Enhanced Ethernet (CEE) DCBX version.
	<b>pre-cee</b>	Specifies to use the standard DCBX version, which is the version released prior to the CEE DCBX release.

**Defaults** The default is auto.

**Command Modes** Interface configuration mode

**Description** Use this command to specify which version of the DCBX protocol to use.

**Usage Guidelines** There are no usage guidelines for this command.

**Examples** To specify which DCBX version to use:

```
switch(conf-if-te-0/1)#lldp dcbx-version cee
```

**See Also** none



## lldp disable

Disables LLDP on the interface.

<b>Synopsis</b>	<b>lldp disable</b> <b>no lldp disable</b>
<b>Operands</b>	none
<b>Defaults</b>	By default, LLDP is enabled at both the global and interface levels.
<b>Command Modes</b>	Interface configuration mode
<b>Description</b>	Use this command to disable LLDP on the interface. Use the <b>no lldp disable</b> command to enable LLDP on the interface.
<b>Usage Guidelines</b>	There are no usage guidelines for this command.
<b>Examples</b>	To disable LLDP on the interface. <pre>switch(conf-if-te-0/1)#<b>lldp disable</b></pre>
<b>See Also</b>	none

## lldp fcoe-priority-bits

Sets the priorities on which FCoE traffic will be allowed.

**Synopsis** `lldp fcoe-priority-bits value`  
`no lldp fcoe-priority-bits`

**Operands** `value` Specifies the bitmap value. The range of valid values is 0x0-0xff.

**Defaults** The default value is 0x08.

**Command Modes** Interface configuration mode

**Description** Use this command to set the priorities on which FCoE traffic will be allowed. The `no lldp fcoe-priority-bits` command returns to the default setting.

**Usage Guidelines** There are no usage guidelines for this command.

**Examples** To set the priorities on which FCoE traffic will be allowed:  

```
switch(conf-if-te-0/1)#lldp fcoe-priority-bits 0xff
```

**See Also** `protocol lldp`

## lldp profile

Applies a Link Layer Discovery Protocol (LLDP) profile on an interface.

<b>Synopsis</b>	<b>lldp profile</b> <i>name</i> <b>no lldp profile</b>
<b>Operands</b>	<i>name</i> Specifies the profile name.
<b>Defaults</b>	If the parameters are not defined in the profile, the default values are used.
<b>Command Modes</b>	Interface configuration mode
<b>Description</b>	Use this command to apply a Link Layer Discovery Protocol (LLDP) profile on an interface. Use the <b>no lldp profile</b> command to delete the profile from the interface.
<b>Usage Guidelines</b>	You must use the <b>profile</b> command to create an LLDP profile before you can apply the profile to the interface. Only one LLDP profile can exist at any time for a particular interface. When this command is not present, the parameters defined in the global LLDP configuration are used.
<b>Examples</b>	To apply an LLDP profile on an interface: <pre>switch(conf-if-te-0/1)#lldp profile test</pre>
<b>See Also</b>	<b>protocol lldp</b>

## mode

Sets the LLDP mode on the switch.

**Synopsis**    **mode tx | rx**  
              **no mode**

**Operands**    **tx**                      Specifies to enable only the transmit mode.  
              **rx**                      Specifies to enable only the receive mode.

**Defaults**    Both transmit and receive modes are enabled.

**Command Modes**    Protocol LLDP configuration mode

**Description**    Use this command to set the LLDP mode on the switch. Use the **no mode** command to return to the default setting.

**Usage Guidelines**    There are no usage guidelines for this command.

**Examples**    To enable only the transmit mode:  
              switch(conf-lldp)#**mode tx**

**See Also**    **show lldp**

## multiplier

Sets the number of consecutive misses of hello messages before LLDP declares the neighbor as dead.

<b>Synopsis</b>	<b>multiplier</b> <i>value</i> <b>no multiplier</b>
<b>Operands</b>	<i>value</i> Specifies a multiplier value to use. The range of valid values is 1-10.
<b>Defaults</b>	The default multiplier value is 4.
<b>Command Modes</b>	Protocol LLDP configuration mode
<b>Description</b>	Use this command to set the number of consecutive misses of hello messages before LLDP declares the neighbor as dead. Use the <b>no multiplier</b> command to return to the default setting.
<b>Usage Guidelines</b>	There are no usage guidelines for this command.
<b>Examples</b>	To set the number of consecutive misses: <pre>switch(conf-lldp)#<b>multiplier</b> 2</pre>
<b>See Also</b>	<b>hello</b>

## profile

Creates an LLDP profile.

<b>Synopsis</b>	<b>profile</b> <i>name</i> <b>no profile</b> <i>name</i>
<b>Operands</b>	<i>name</i> Assigns a name to the profile. The valid value is a maximum of 32 characters.
<b>Defaults</b>	none
<b>Command Modes</b>	Protocol LLDP configuration mode
<b>Description</b>	Use this command to create an LLDP profile.
<b>Usage Guidelines</b>	When you apply an LLDP profile on an interface using the <b>lldp profile</b> command, it overrides the global configuration. If a profile is not present, then the default global profile is used until you create a valid profile. Up to 64 profiles can be created.
<b>Examples</b>	To create a profile named test: <pre>switch(conf-lldp)#<b>profile test</b></pre> To delete a profile named test: <pre>switch(conf-lldp)#<b>no profile test</b></pre>
<b>See Also</b>	<b>lldp profile</b>

## protocol lldp

Enters the Link Layer Discovery Protocol (LLDP) configuration mode.

<b>Synopsis</b>	<b>protocol lldp</b> <b>no protocol lldp</b>
<b>Operands</b>	none
<b>Defaults</b>	The LLDP and DCBX protocols are enabled.
<b>Command Modes</b>	Global configuration mode
<b>Description</b>	Use this command to enter LLDP configuration mode to be able to make changes to the parameters. Use the <b>no protocol lldp</b> command to return to the default setting.
<b>Usage Guidelines</b>	There are no usage guidelines for this command.
<b>Examples</b>	To clear all LLDP configurations: <pre>switch(config)#no protocol lldp</pre>
<b>See Also</b>	none

## show debug lldp

Displays the LLDP debugging status on the switch.

**Synopsis**     **show debug lldp**

**Operands**    none

**Defaults**    There are no default configurations for this command.

**Command Modes**   EXEC mode

**Description**    Use this command to display the LLDP debugging status on the switch.

**Usage Guidelines**   There are no usage guidelines for this command.

**Examples**       To display the LLDP debugging status on the switch:

```
switch#show debug lldp
LLDP debugging status:
Interface te0/0      : Transmit Receive  Detail
```

**See Also**     none



## show lldp interface

Displays the LLDP status on the specified interface.

**Synopsis** `show lldp interface [tengigabitethernet slot/port]`

**Operands** `tengigabitethernet`  
 Specifies a valid 10 Gbps Ethernet interface.  
`slot` Specifies a valid slot number.  
`port` Specifies a valid port number.

**Defaults** There are no default configurations for this command.

**Command Modes** EXEC mode

**Description** Use this command to display the LLDP status on the specified interface.

**Usage Guidelines** There are no usage guidelines for this command.

**Examples** To display all the LLDP interface information for a selected interface:

```
switch#show lldp interface tengigabitethernet 0/0
LLDP information for Te 0/0
  State:                Enabled
  Mode:                 Receive/Transmit
  Advertise Transmitted: 30 seconds
  Hold time for advertise: 120 seconds
  Re-init Delay Timer:  2 seconds
  Tx Delay Timer:       1 seconds
  DCBX Version :        CEE
  Auto-Sense :          Yes
  Transmit TLVs:        Chassis ID          Port ID
                       TTL                  IEEE DCBX
                       DCBX FCoE App        DCBX FCoE Logical Link
                       Link Prim            Brocade Link
  DCBX FCoE Priority Bits: 0x8
```

**See Also** none

## show lldp neighbors

Displays LLDP information for all neighboring devices on the specified interface.

<b>Synopsis</b>	<b>show lldp neighbors</b> [ <b>interface tengigabitethernet slot/port detail</b> ]
<b>Operands</b>	<p><b>interface</b> Use this keyword to specify the 10 Gbps Ethernet interface using the following operand followed by the slot or port number.</p> <p><b>tengigabitethernet</b> Specifies a valid 10 Gbps Ethernet interface.</p> <p><i>slot</i> Specifies a valid slot number.</p> <p><i>port</i> Specifies a valid port number.</p> <p><i>detail</i> Displays all the LLDP neighbor information in detail for the specified interface.</p>
<b>Defaults</b>	There are no default configurations for this command.
<b>Command Modes</b>	EXEC mode
<b>Description</b>	Use this command to display LLDP information for all neighboring devices on the specified interface.
<b>Usage Guidelines</b>	If you do not use the <b>interface</b> operand, only the mandatory TLVs are displayed.
<b>Examples</b>	<p>To display detailed LLDP neighbor information on a specific interface:</p> <pre>switch#show lldp neighbors interface tengigabitethernet 0/8 detail  Neighbors for Interface Te 0/8  MANDATORY TLVs ===== Local Interface: Te 0/8      Remote Interface: Te 0/8 (IF Name) Dead Interval: 120 secs  Remaining Life : 100 secs Tx: 536  Rx: 535 Chassis ID: 0005.1e76.1020 (MAC) Remote Mac: 0005.1e76.102c  OPTIONAL TLVs ===== Port Interface Description: Te 0/8 System Name: sw0 System Description: Fibre Channel Switch. System Capabilities: Switching Routing System Capabilities Enabled: Switching  Link Prim: 257 Remote Protocols Advertised: Multiple Spanning Tree Protocol Remote VLANs Configured: VLAN ID: 1  VLAN Name: default AutoNego Support: Supported Not Enabled AutoNego Capability: 0 Operational MAU Type: 0 Link Aggregation Capability: Capable</pre>

```
Link Aggregation Status: Disabled
Port Vlan Id: 1
Port & Protocol Vlan Flag: Supported Not enabled
Port & Protocol Vlan Id: 0
Link Aggregation Port Id: 0
Max Frame Size: 2500
Management Address: 10.32.152.21 (IPv4)
Interface Numbering: 2
Interface Number: 0x4080100 (67633408)
OID: 0x100f99b4

DCBX TLVs
=====

DCBX Version : pre-CEE
DCBX Ctrl OperVersion: 0 MaxVersion: 0 SeqNo: 2 AckNo: 1
DCBX ETS OperVersion: 0 MaxVersion: 0 EN: 1 Will: 0 Err: 0
Pri-Map: 15 15 15 15 15 15 15 15
BWG ID: 00 Percentage: 000
BWG ID: 01 Percentage: 000
BWG ID: 02 Percentage: 000
BWG ID: 03 Percentage: 000
BWG ID: 04 Percentage: 000
BWG ID: 05 Percentage: 000
BWG ID: 06 Percentage: 000
BWG ID: 07 Percentage: 000
DCBX PFC OperVersion: 0 MaxVersion: 0 EN: 1 Will: 0 Err: 0
Admin-Map: 0xf0
FCoE App OperVersion: 0 MaxVersion: 0 EN: 1 Will: 0 Err: 0
User-Pri-Map: 0x00
FCoE LLS OperVersion: 0 MaxVersion: 0 EN: 1 Will: 0 Err: 0
Logic Link Status: Down
LAN LLS OperVersion: 0 MaxVersion: 0 EN: 1 Will: 0 Err: 0
Logic Link Status: Up
switch#
```

**See Also** none

**show lldp statistics**

Displays the LLDP statistics on all interfaces or a specified interface.

<b>Synopsis</b>	<b>show lldp statistics [interface tengigabitethernet slot/port]</b>	
<b>Operands</b>	<b>interface</b>	Use this keyword to specify the 10 Gbps Ethernet interface using the following operand followed by the slot or port number.
	<b>tengigabitethernet</b>	Specifies a valid 10 Gbps Ethernet interface for which to display the LLDP statistics.
	<i>slot</i>	Specifies a valid slot number.
	<i>port</i>	Specifies a valid port number.
<b>Defaults</b>	There are no default configurations for this command.	
<b>Command Modes</b>	EXEC mode	
<b>Description</b>	Use this command to display LLDP statistics on all interfaces or a specified interface.	
<b>Usage Guidelines</b>	If you do not specify the <b>interface tengigabitethernet</b> operand, this command displays the LLDP statistics for all interfaces.	
<b>Examples</b>	To display LLDP statistics on the specified interface:	
	<pre>switch#show lldp statistics interface tengigabitethernet 0/8 LLDP Interface statistics for Te 0/8 Frames transmitted: 555 Frames Aged out:    0 Frames Discarded:  0 Frames with Error: 0 Frames Recieved:   554 TLVs discarded:    0 TLVs unrecognized: 0</pre>	
<b>See Also</b>	none	

## system-description LINE

Sets the global system description specific to LLDP.

<b>Synopsis</b>	<b>system-description</b> <i>line</i> <b>no system-description</b>
<b>Operands</b>	<i>line</i> Specifies a description for the LLDP system. The valid value is a maximum of 50 characters.
<b>Defaults</b>	There are no default configurations for this command.
<b>Command Modes</b>	Protocol LLDP mode.
<b>Description</b>	Use this command to set the global system description specific to LLDP. Use <b>no system-description</b> command to clear the global LLDP system description.
<b>Usage Guidelines</b>	There are no usage guidelines for this command.
<b>Examples</b>	To set the global system description specific to LLDP: <pre>switch(conf-lldp)#<b>system-description Brocade</b></pre>
<b>See Also</b>	<b>system-name</b>

## system-name

Sets the global system name specific to LLDP.

**Synopsis** `system-name name`

**Operands** `name` Specifies a system name for the LLDP. The valid values is a maximum of 32 characters.

**Defaults** By default, the host name from the switch is used.

**Command Modes** Protocol LLDP configuration mode

**Description** Use this command to set the global system name specific to LLDP.

**Usage Guidelines** There are no usage guidelines for this command.

**Examples** To specify a system name for the LLDP:  
`switch(conf-lldp)#system-name Brocade`

**See Also** `system-description`

# Link Aggregation Control Protocol Commands

---

## channel-group

Enables Link Aggregation on an interface.

**Synopsis** `channel-group number mode [active | passive | on] [type standard | brocade]`  
`no channel-group`

**Operands**

<i>number</i>	Specifies a Link Aggregation Group (LAG) port channel-group number to which this link should administratively belong to. The range of valid values is 1-63.
<b>mode</b>	Specifies the mode of Link Aggregation.
<i>active</i>	Enables the initiation of LACP negotiation on an interface.
<i>passive</i>	Disables LACP on an interface.
<i>on</i>	Enables static link aggregation on an interface.
<b>type</b>	Specifies the type of LAG.
<i>standard</i>	Specifies the 802.3ad standard-based LAG.
<i>brocade</i>	Specifies the Brocade proprietary hardware-based trunking.

**Defaults** By default, the type is set to standard.

**Command Modes** Interface configuration mode

**Description** Use this command to add an interface to a port-channel specified by the channel-group number. This command enables link aggregation on an interface, so that it may be selected for aggregation by the local system. Use the **no channel-group** command to remove the port-channel members.

**Usage Guidelines** Only a maximum of 24 LAGs can be created. Note the following:

- A maximum of four link aggregation groups can be created per switch when the **type** is set to *brocade*.
- A maximum of four links can become part of a single aggregation group when the **type** is set to *brocade* and they must be on the same port-channel.
- Links 0-7 belong to port-channel 1; links 8-15 belong to port-channel 2, and links 16-23 belong to port-channel 3.
- For the *standard* type, a maximum of 16 links can be aggregated per aggregation group and they can be members of any port-channel.

**Examples** To set the channel-group number to 4 and the mode to active:

## 6 channel-group

```
switch(conf-if)#channel-group 4 mode active
```

**See Also**    interface port-channel



## clear lacp

Clears the Link Aggregation Group Control Protocol (LACP) counters on a specific port-channel.

**Synopsis**     **clear lacp** *number* **counters**

**Operands**    *number*               Specifies the port channel-group number. The range of valid values is 1-63.  
**counters**       Clears traffic counters.

**Defaults**     There are no default configurations for this command.

**Command Modes**   Privileged EXEC mode

**Description**     Use this command to clear the LACP counters per specified channel-group.

**Usage Guidelines**   There are no default configurations for this command.

**Examples**        To clear the LACP counters for a specific port-channel:

```
switch#clear lacp 10 counters
```

**See Also**        **show lacp counters**

## clear lacp counters

Clears the Link Aggregation Group Control Protocol (LACP) counters on all port-channels.

<b>Synopsis</b>	<b>clear lacp counters</b>
<b>Operands</b>	none
<b>Defaults</b>	There are no default configurations for this command.
<b>Command Modes</b>	Privileged EXEC mode
<b>Description</b>	Use this command to clear the LACP counters for all port-channels.
<b>Usage Guidelines</b>	There are no default configurations for this command.
<b>Examples</b>	To clear the counters for all port-channels: <pre>switch#clear lacp counters</pre>
<b>See Also</b>	<b>show lacp</b>

## debug lacp

Enables debugging for the Link Aggregation Control Protocol (LACP).

<b>Synopsis</b>	<b>debug lacp</b> {all   cli   event   nsm   pdu {rx {all   interface tengigabitethernet slot/port}   tx {all   interface tengigabitethernet slot/port} }}   sync   timer   trace level number}	
	<b>no debug lacp</b> {all   cli   event   nsm   pdu {rx {all   interface tengigabitethernet slot/port}   tx {all   interface tengigabitethernet slot/port} }}   sync   timer   trace level number}	
<b>Operands</b>	<b>all</b>	Turns on all debugging.
	<b>cli</b>	Turns on command line interface debugging.
	<b>event</b>	Turns on event debugging.
	<b>nsm</b>	Turns on Network Services Module (NSM) debugging.
	<b>pdu</b>	Turns on PDU debugging.
	<b>rx all</b>	Turns on debugging for received LACP packets on all interfaces.
	<b>rx interface</b>	Turns on debugging for received LACP packets on the specified interface.
	<b>interface tengigabitethernet</b>	Specifies the 10 Gbps Ethernet interface.
	<i>slot</i>	Specifies the slot number.
	<i>port</i>	Specifies the port number.
	<b>tx all</b>	Turns on debugging for transmitted LACP packets on all interfaces.
	<b>tx interface</b>	Turns on debugging for transmitted LACP packets on the specified interface.
	<b>interface tengigabitethernet</b>	Specifies the 10 Gbps Ethernet interface.
	<i>slot</i>	Specifies the slot number.
	<i>port</i>	Specifies the port number.
	<b>sync</b>	Turns on debugging for LACP sync transitions.
	<b>timer</b>	Turns on debugging for LACP timers.
	<b>trace level number</b>	Specifies the trace level number. The range of valid values is 1-7.
<b>Defaults</b>	By default, debugging is not turned on.	
<b>Command Modes</b>	Privileged EXEC mode	
<b>Description</b>	Use this command to enable debugging for Link Aggregation Control Protocol (LACP). Use the <b>no debug</b> command to disable debugging.	
<b>Usage Guidelines</b>	To display debug outputs on a specific cmsh session, use the <b>terminal monitor</b> command.	

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**Examples** To enable debugging of LACP PDUs for transmitted and received packets on all interfaces:

```
switch#debug lacp pdu tx all  
switch#debug lacp pdu rx all  
switch#show debug lacp  
LACP rx debugging is on  
LACP tx debugging is on
```

**See Also** **show debug lacp**

## lACP system-priority

Sets the Link Aggregation Control Protocol (LACP) system priority.

<b>Synopsis</b>	<b>lACP system-priority</b> <i>value</i> <b>no lACP system-priority</b>
<b>Operands</b>	<i>value</i> Specifies the value of the LACP system priority. The range of valid values is 1-65535.
<b>Defaults</b>	The default system-priority value is 32768.
<b>Command Modes</b>	Global configuration mode
<b>Description</b>	Use this command to set the system priority of a local system. This determines which system is responsible for resolving conflicts in the choice of aggregation groups. Use the <b>no lACP system-priority</b> command to reset the system priority to the default value.
<b>Note</b>	Lower numerical values have higher priorities.
<b>Usage Guidelines</b>	There are no usage guidelines for this command.
<b>Examples</b>	To set the LACP system-priority to 68: <pre>switch(config)#lACP system-priority 68</pre> To clear the configured LACP system-priority: <pre>switch(config)#no lACP system-priority</pre>
<b>See Also</b>	none

## lacp timeout

Sets the timeout value used by LACP to exchange packets on an interface.

<b>Synopsis</b>	<b>lacp timeout [long   short]</b> <b>no lacp timeout</b>	
<b>Operands</b>	<b>timeout</b>	Specifies the number of seconds before invalidating a received Link Aggregation Control Protocol (LACP) data unit (DU).
	<b>long</b>	Specifies a long timeout value.
	<b>short</b>	Specifies a short timeout value.
<b>Defaults</b>	By default, the short timeout value is 3 seconds for Brocade trunks. For standard trunks, the long timeout value is 90 seconds.	
<b>Command Modes</b>	Interface configuration mode	
<b>Description</b>	Use this command to set the short timeout value for Brocade trunks or to set the long timeout value for standard trunks. Use the <b>no lacp timeout</b> command to return to the default value.	
<b>Usage Guidelines</b>	If the LACP_timeout bit (encoded in Actor_State and Partner_State fields) is set to 1, the short timeout takes effect; if set to 0 (zero), the long timeout takes effect.	
<b>Examples</b>	To set the LACP short timeout value to 5 seconds: <pre>switch(conf-if-te-0/1)#lacp timeout short 5</pre>	
<b>See Also</b>	none	

## show lacp counter

Displays the Link Aggregation Control Protocol (LACP) counters on all port-channels or a specified interface.

**Synopsis** `show lacp counter number`

**Operands** `number` Specifies the port-channel number to display. The range of valid values is 1-63.

**Defaults** There are no default configurations for this command.

**Command Modes** EXEC mode

**Description** Use this command to display the LACP packet counters on all interfaces that belong to a port-channel or a specific interface.

**Usage Guidelines** There are no usage guidelines for this command.

**Examples** To show the LACP counters for port-channel 10:

```
switch#show lacp counter 10
% Traffic statistics
Port          LACPDUs          Marker          Pckt err
           Sent    Recv    Sent    Recv    Sent    Recv
% Aggregator Po 10 1000000
Te 0/1        65     0       0     0       0     0
Te 0/2        64     0       0     0       0     0
Te 0/3        64     0       0     0       0     0
Te 0/4         0     0       0     0       0     0
switch#
```

**See Also** `clear lacp counters`

## show lacp-sys-id

Displays the Link Aggregation Control Protocol (LACP) system ID and priority information.

<b>Synopsis</b>	<b>show lacp sys-id</b>
<b>Operands</b>	none
<b>Defaults</b>	There are no default configurations for this command.
<b>Command Modes</b>	EXEC mode
<b>Description</b>	Use this command to display the LACP system ID and priority.
<b>Usage Guidelines</b>	The system priority and the system Media Access Control (MAC) address make up the system identification. The first two bytes are the system priority, and the last six bytes are the globally administered individual MAC addresses associated with the system.
<b>Examples</b>	To display the local system ID: <pre>switch#show lacp sys-id % System 8000,00-05-1e-76-1a-a6</pre>
<b>See Also</b>	none



## show port-channel

Displays the Link Aggregation Group (LAG) information for a port-channel.

<b>Synopsis</b>	<b>show port-channel</b> [ <i>channel-group-number</i>   <b>detail</b>   <b>load-balance</b>   <b>summary</b> ]
<b>Operands</b>	<i>channel-group number</i> Specifies a LAG port channel-group number to display. The range of valid values is 1-63.
	<b>detail</b> Displays detailed LAG information for a port-channel.
	<b>load-balance</b> Displays the load-balance or frame-distribution scheme among ports in the port-channel.
	<b>summary</b> Displays the summary information per channel-group.
<b>Note</b>	LAG interfaces are called port-channels.
<b>Defaults</b>	There are no default configurations for this command.
<b>Command Modes</b>	EXEC mode
<b>Description</b>	Displays the LAGs present on the system with details about the LACP counters on their member links.
<b>Usage Guidelines</b>	If you do not specify a port-channel, all port-channels are displayed.
<b>Examples</b>	To display information for port-channel 10:  <pre>switch#show port-channel 10 % Aggregator Po 10 0 Admin Key: 0010 - Oper Key 0010 Partner System ID: 0x0000,00-00-00-00-00-00 Partner Oper Key 0000 % Link: Te 0/1 (67174401) sync: 0 % Link: Te 0/2 (67239938) sync: 0</pre>
<b>See Also</b>	none

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# Layer 2 System Commands

---

## mac-address-table

Use this command to set the aging time or to add static addresses to the MAC address table.

<b>Synopsis</b>	<pre>mac-address-table {aging-time seconds   static mac-addr forward [port-channel number   tengigabitethernet slot/port   vlan vlan_id] }  no mac-address-table {aging-time   static mac-addr forward [ port-channel number   tengigabitethernet slot/port   vlan vlan_id] }</pre>
<b>Operands</b>	<p><b>aging-time seconds</b> Specifies the time in seconds that a learned MAC address will persist after the last update. If the aging time is set to zero (0), it means that aging is disabled. The range of valid values is 10-100000.</p> <p><b>static mac-addr</b> Specifies the Media Access Control (MAC) address (unicast or multicast) to add to the address table. Packets with this destination address received in the specified VLAN are forwarded to the specified interface.</p> <p><b>forward</b> Forwards the MAC address to the interface.</p> <p><b>port-channel number</b> Specifies the port-channel number. The range of valid values is 1–63.</p> <p><b>tengigabitethernet</b> Specifies a valid 10 Gbps Ethernet interface.</p> <p><b>slot</b> Specifies a valid slot number.</p> <p><b>port</b> Specifies a valid port number.</p> <p><b>vlan vlan_id</b> Specifies the VLAN number. The range of valid values is 1-3583.</p>
<b>Defaults</b>	The default aging time is 300 seconds.
<b>Command Modes</b>	Global configuration mode
<b>Description</b>	Use this command to set the aging time or to add static addresses to the MAC address table.
<b>Usage Guidelines</b>	The <b>vlan</b> keyword is mandatory because the switch only supports independent VLAN learning (IVL).
<b>Examples</b>	<p>To add the static address 0011.2222.3333 to the MAC address table with a packet received on VLAN 100:</p> <pre>switch(config)#mac-address-table static 0011.2222.3333 forward tengigabitethernet 0/1 vlan 100</pre>

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To set the aging time to 10 minutes:

```
switch(config)#mac-address-table aging-time 600
```

**See Also**    **show mac address-table static**

## show mac-address-table

Displays a specific MAC address table static and dynamic entry or the MAC address table static and dynamic entries for a specific interface or VLAN.

<b>Synopsis</b>	<b>show mac-address-table</b> [ <b>address</b> <i>mac-addr</i>   <b>aging-time</b>   <b>count</b>   <b>dynamic</b>   <b>interface</b> { <b>tengigabitethernet</b> <i>slot/port</i>   <b>port-channel</b> <i>number</i> }   <b>linecard interface</b> <b>tengigabitethernet</b> <i>slot/port</i>   <b>static</b>   <b>vlan</b> <i>vlan_id</i> ]
<b>Operands</b>	<p><b>address</b> <i>mac-address</i> Specifies a 48-bit MAC address. The valid format is H.H.H (available in EXEC mode only).</p> <p><b>aging-time</b> Displays the aging time.</p> <p><b>count</b> Displays the count of forwarding entries.</p> <p><b>dynamic</b> Displays the dynamic MAC addresses.</p> <p><b>interface</b> Displays the forwarding information of an interface.</p> <p style="padding-left: 20px;"><b>tengigabitethernet</b> Specifies a valid 10 Gbps Ethernet interface.</p> <p style="padding-left: 40px;"><i>slot</i> Specifies a valid slot number.</p> <p style="padding-left: 40px;"><i>port</i> Specifies a valid port number.</p> <p style="padding-left: 20px;"><b>port-channel</b> <i>number</i> Specifies the port-channel number. The range of valid values is 1–63.</p> <p><b>linecard</b> Displays the linecard information.</p> <p><b>interface</b> Displays the forwarding information of an interface.</p> <p style="padding-left: 20px;"><b>tengigabitethernet</b> Specifies a valid 10 Gbps Ethernet interface.</p> <p style="padding-left: 40px;"><i>slot</i> Specifies a valid slot number.</p> <p style="padding-left: 40px;"><i>port</i> Specifies a valid port number.</p> <p><b>static</b> Displays the static MAC addresses.</p> <p><b>vlan</b> <i>vlan_id</i> Specifies the VLAN number. The range of valid values is 1-3583.</p>
<b>Defaults</b>	No static addresses are configured.
<b>Command Modes</b>	EXEC mode
<b>Description</b>	Use this command to display a specific static or dynamic MAC address entry or all entries for a specific interface, a specific VLAN, a specific linecard, or for all interfaces and all VLANs.
<b>Usage Guidelines</b>	There are no usage guidelines for this command.
<b>Examples</b>	To display a specific MAC address in the table:  <pre>switch#show mac-address-table address 0011.2222.3333</pre>

## 7 show mac-address-table

```
VlanId  Mac-address      Type   State   Ports
100     0011.2222.3333   Static Inactive Te 0/1
Total MAC addresses : 1
```

To display the aging time for a specific MAC address table:

```
switch#show mac-address-table aging-time
MAC Aging-time : 300 seconds
```

To display a dynamic MAC address table:

```
switch#show mac-address-table dynamic
VlanId  Mac-address      Type   State   Ports
100     0011.2222.5555   Dynamic Inactive Te 0/1
100     0011.2222.6666   Dynamic Inactive Te 0/1
Total MAC addresses : 2
```

**See Also** `show mac address-table dynamic`, `show mac address-table static`, `show mac address-table linecard`, `show mac address-table count`

## Layer 2 ACL commands

---

### clear counters access-list mac

Clears all the Media Access Control (MAC) ACL counters for all interfaces which have ACL applied on them or for a specific interface.

<b>Synopsis</b>	<code>clear counters access-list mac name [interface   port-channel number   tengigabitethernet slot/port   vlan vlan_id]</code>
<b>Operands.</b>	<p><i>name</i> Specifies the name of the MAC ACL.</p> <p><b>interface</b> Use this keyword to specify any of the following interfaces:</p> <ul style="list-style-type: none"> <li><b>tengigabitethernet</b> Specifies a valid 10 Gbps Ethernet interface.</li> <li><i>slot</i> Specifies a valid slot number.</li> <li><i>port</i> Specifies a valid port number.</li> <li><b>port-channel number</b> Specifies the port-channel number. The range of valid values is 1-63.</li> <li><b>vlan vlan_id</b> Specifies the VLAN number. The range of valid values is 1-3583.</li> </ul>
<b>Defaults</b>	There are no default configurations for this command.
<b>Command Modes</b>	Privileged EXEC mode
<b>Description</b>	Use this command to clear counters for all or for a specific interface for MAC access list counters.
<b>Usage Guidelines</b>	If the <b>interface</b> keyword is not specified, then ACL counters on all interfaces which have this ACL applied are cleared. There are 255 ACL counters supported per port group.
<b>Example</b>	<p>To clear counters for the configured MAC access list named test on an interface:</p> <pre>switch#clear counters access-list mac test interface tengigabitethernet 0/1</pre> <p>To clear counters for the configured MAC access list named test on all interfaces on which this ACL is applied:</p> <pre>switch#clear counters access-list mac test</pre>
<b>See Also</b>	<code>show mac access-list</code> , <code>show statistics access-list</code>

## deny (extended ACLs)

Configures a MAC address rule to drop traffic based on the source and destination MAC addresses.

<b>Synopsis</b>	<b>deny</b> {any   host <i>MAC_ACL</i>   <i>MAC_ACL</i> } {any   host <i>MAC_ACL</i>   <i>MAC_ACL</i> } [ <i>EtherType</i>   arp   fcoe   ipv4] [count]	
	<b>no deny</b> {any   host <i>MAC_ACL</i>   <i>MAC_ACL</i> } {any   host <i>MAC_ACL</i>   <i>MAC_ACL</i> } [ <i>EtherType</i>   arp   fcoe   ipv4]	
<b>Operands</b>	<b>any</b>	Specifies any source MAC address.
	<b>host <i>MAC_ACL</i></b>	Specifies the source host MAC address for which to set deny conditions. Use the format HHHH.HHHH.HHHH.
	<b><i>MAC_ACL</i></b>	Specifies the source host MAC address for which to set deny conditions. Use the format HHHH.HHHH.HHHH.
	<b>any</b>	Specifies any destination MAC address.
	<b>host <i>MAC_ACL</i></b>	Specifies the destination host address for which to set deny conditions. Use the format HHHH.HHHH.HHHH.
	<b><i>MAC_ACL</i></b>	Specifies the destination host address for which to set deny conditions. Use the format HHHH.HHHH.HHHH.
	<b><i>Ethertype</i></b>	Specifies the protocol number for which to set the deny conditions. The range of valid values is 1536-65535.
	<b>arp</b>	Specifies to deny the Address Resolution Protocol (0x0806).
	<b>fcoe</b>	Specifies to deny the Fibre Channel over Ethernet Protocol (0x8906).
	<b>ipv4</b>	Specifies to deny the IPv4 protocol (0x0800).
	<b>count</b>	Enables counting of the packets matching the rule.
<b>Defaults</b>	By default, no MAC ACLs are configured.	
<b>Command Modes</b>	Feature Access Control List Configuration mode	
<b>Description</b>	Use this command to configure rules to match and drop traffic based on the source and destination MAC addresses and the protocol type. You can also enable counters for a specific rule. There are 255 ACL counters supported per port group. Use the <b>no deny</b> command to remove a rule from the MAC ACL.	
<b>Usage Guidelines</b>	The first set of {any   host <i>MAC_ACL</i>   <i>MAC_ACL</i> } parameters is specific to the source MAC address. The second set of {any   host <i>MAC_ACL</i>   <i>MAC_ACL</i> } parameters is specific to the destination MAC address.	
<b>Example</b>	To create a rule in a MAC extended ACL to drop IPv4 traffic from the source MAC address 0022.3333.4444 to the destination MAC address 0022.3333.5555 and to enable the counting of packets:  <pre>switch(conf-macl-ext)#deny 0022.3333.4444 0022.3333.5555 ipv4 count</pre>	
	To delete a rule from a MAC extended ACL:	



```
switch(conf-macl-ext)#no deny 0022.3333.4444 0022.3333.5555 ipv4
```

**See Also**    **mac-access-list extended, mac-access-list standard, permit**

**deny (standard ACLs)**

Configures a MAC address rule to drop traffic based on the source MAC address.

<b>Synopsis</b>	<b>deny</b> { <i>MAC_ACL</i>   <b>any</b> } [ <b>count</b> ] <b>no deny</b> { <i>MAC_ACL</i>   <b>any</b> }
<b>Operands</b>	<p><i>MAC_ACL</i> Specifies the source host MAC address for which to set deny conditions. Use the format HHHH.HHHH.HHHH.</p> <p><b>any</b> Specifies any source MAC address.</p> <p><b>count</b> Enables counting of the packets matching the rule.</p>
<b>Defaults</b>	By default, no MAC ACLs are configured.
<b>Command Modes</b>	Feature Access Control List Configuration mode
<b>Description</b>	Use this command to configure rules to match and to drop traffic based on the source MAC address. You can also enable counters for a specific rule. There are 255 ACL counters supported per port group. Use the <b>no deny</b> command to remove a rule from the MAC ACL.
<b>Usage Guidelines</b>	There are no usage guidelines for this command.
<b>Example</b>	<p>To create a rule in a MAC standard ACL to drop traffic from the source MAC address 0022.3333.4444 and to enable the counting of packets:</p> <pre>switch(conf-macl-std)#deny 0022.3333.4444 count</pre> <p>To delete a rule from a MAC standard ACL:</p> <pre>switch(conf-macl-std)#no deny 0022.3333.4444</pre>
<b>See Also</b>	<b>mac-access-list extended</b> , <b>permit</b>

## mac access-list extended

Creates and assigns a name to the extended MAC access list.

<b>Synopsis</b>	<b>mac access-list extended</b> <i>name</i> <b>no mac access-list extended</b> <i>name</i>
<b>Operands</b>	<i>name</i> Assigns a name to the MAC extended access list. The maximum character limit is 64.
<b>Command Modes</b>	Global configuration mode
<b>Description</b>	<p>Use this command to create an extended MAC access list. If the ACL is already created, this command puts the switch in the extended MAC access-list configuration mode. Use the <b>no mac access-list extended</b> command to remove the access list.</p> <p>Extended ACLs allow you to filter traffic based on the following:</p> <ul style="list-style-type: none"><li>• Source MAC address</li><li>• Destination MAC address</li><li>• EtherType</li></ul> <p>You can apply named MAC extended ACLs to VLANs and to Layer 2 interfaces.</p>
<b>Usage Guidelines</b>	Standard and extended MAC ACLs cannot share the same name.
<b>Example</b>	<p>To create a MAC extended ACL named mac1:</p> <pre>switch(config)#mac access-list extended mac1 switch(config-macl-ext)#</pre> <p>To delete a MAC extended ACL named mac1:</p> <pre>switch(config)#no mac access-list extended mac1</pre>
<b>See Also</b>	<b>deny, permit, show access-lists</b>

**mac access-list standard**

Creates and assigns a name to the standard MAC access list.

<b>Synopsis</b>	<b>mac access-list standard</b> <i>name</i> <b>no mac access-list standard</b> <i>name</i>
<b>Operands</b>	<i>name</i> Assigns a name to the MAC standard access list. The maximum character limit is 64.
<b>Command Modes</b>	Global configuration mode
<b>Description</b>	Use this command to create a standard MAC access list. If ACL is already created, this command puts the switch in the standard MAC access-list configuration mode. Use the <b>no mac access-list standard</b> command to remove the access list.  Standard ACLs allow you to filter traffic based on the source MAC address. You can apply named MAC standard ACLs to VLANs and to Layer 2 interfaces.
<b>Usage Guidelines</b>	Standard and extended MAC ACLs cannot share the same name.
<b>Example</b>	To create a MAC standard ACL named mac1:  <pre>switch(config)#mac access-list standard mac1 switch(config-macl-std)#</pre> To delete a MAC standard ACL named mac1:  <pre>switch(config)#no mac access-list standard mac1</pre>
<b>See Also</b>	<b>deny, permit, show access-lists</b>

## mac access-group

Applies rules specified in a MAC ACL to traffic entering an interface.

<b>Synopsis</b>	<b>mac access-group</b> <i>name</i> <b>in</b> <b>no mac access-group</b> <i>name</i>
<b>Operands</b>	<i>name</i> Specifies the name of the standard or extended MAC access list. <b>in</b> Specifies to filter inbound packets only.
<b>Default</b>	There are no access lists applied to the interface.
<b>Command Modes</b>	Interface configuration mode
<b>Description</b>	Use this command to apply a MAC ACL to a Layer 2 or a VLAN interface. You create the MAC ACL by using the <b>mac access-list</b> global configuration command. Use the <b>no mac access-group</b> command to remove the MAC ACL from the interface.
<b>Usage Guidelines</b>	<p>You can assign one MAC ACL (standard or extended) to an interface.</p> <p>When a packet is received on an interface with a MAC ACL applied, the switch checks the rules in the ACL. If any of the rules match, the switch permits or drops the packet, according to the rule. If the specified ACL does not exist, the switch permits all the packets.</p>
<b>Example</b>	<p>To apply a MAC ACL named macacl2 on an interface:</p> <pre>switch(conf-if)#mac access-group macacl2 in</pre> <p>To remove a MAC ACL named macacl2 from an interface:</p> <pre>switch(conf-if)#no mac access-group macacl2</pre>
<b>See Also</b>	<b>mac access-list standard</b> , <b>mac access-list extended</b> , <b>show access-lists</b>

## permit (extended ACLs)

Configures a MAC address rule to permit traffic based on the source and destination MAC addresses.

<b>Synopsis</b>	<b>permit</b> { <b>any</b>   <b>host</b> <i>MAC_ACL</i>   <i>MAC_ACL</i> } { <b>any</b>   <b>host</b> <i>MAC_ACL</i>   <i>MAC_ACL</i> } [ <i>EtherType</i>   <b>arp</b>   <b>fcoe</b>   <b>ipv4</b> ] [ <b>count</b> ]	
	<b>no permit</b> { <b>any</b>   <b>host</b> <i>MAC_ACL</i>   <i>MAC_ACL</i> } { <b>any</b>   <b>host</b> <i>MAC_ACL</i>   <i>MAC_ACL</i> } [ <i>EtherType</i>   <b>arp</b>   <b>fcoe</b>   <b>ipv4</b> ]	
<b>Operands</b>	<b>any</b>	Specifies any source MAC address.
	<b>host</b> <i>MAC_ACL</i>	Specifies the source host MAC address for which to set permit conditions. Use the format HHHH.HHHH.HHHH.
	<i>MAC_ACL</i>	Specifies the source host MAC address for which to set permit conditions. Use the format HHHH.HHHH.HHHH.
	<b>any</b>	Specifies any destination MAC address.
	<b>host</b> <i>MAC_ACL</i>	Specifies the destination host address for which to set permit conditions. Use the format HHHH.HHHH.HHHH.
	<i>MAC_ACL</i>	Specifies the destination host address for which to set permit conditions. Use the format HHHH.HHHH.HHHH.
	<i>Ethertype</i>	Specifies the protocol number for which to set the permit conditions. The range of valid values is 1536-65535.
	<b>arp</b>	Specifies to permit the Address Resolution Protocol (0x0806).
	<b>fcoe</b>	Specifies to permit the Fibre Channel over Ethernet Protocol (0x8906).
	<b>ipv4</b>	Specifies to permit the IPv4 protocol (0x0800).
	<b>count</b>	Enables counting of the packets matching the filter rule.
<b>Defaults</b>	By default, no MAC ACLs are configured.	
<b>Command Modes</b>	Feature Access Control List Configuration mode	
<b>Description</b>	Use this command to configure rules to match and to permit traffic based on the source and destination MAC addresses, and the protocol type. You can also enable counters for a specific rule. There are 255 ACL counters supported per port group. Use the <b>no permit</b> command to remove a rule from the MAC ACL.	
<b>Usage Guidelines</b>	The first set of { <b>any</b>   <b>host</b> <i>MAC_ACL</i>   <i>MAC_ACL</i> } parameters is specific to the source MAC address. The second set of { <b>any</b>   <b>host</b> <i>MAC_ACL</i>   <i>MAC_ACL</i> } parameters is specific to the destination MAC address.	
<b>Example</b>	To create a rule in a MAC extended ACL to permit IPv4 traffic from the source MAC address 0022.3333.4444 to the destination MAC address 0022.3333.5555 and to enable the counting of packets:	
	<pre>switch(conf-macl-ext)#<b>permit</b> 0022.3333.4444 0022.3333.5555 <b>ipv4</b> <b>count</b></pre>	

To delete a filter rule in a MAC extended ACL:

```
switch(conf-macl-ext)#no permit 0022.3333.4444 0022.3333.5555 ipv4
```

**See Also** [mac-access-list extended](#), [mac-access-list standard](#), [no seq](#)

## permit (standard ACLs)

Configures a MAC address rule to permit traffic based on the source MAC address.

<b>Synopsis</b>	<b>permit</b> { <i>MAC_ACL</i>   <b>any</b> } [ <b>count</b> ] <b>no permit</b> { <i>MAC_ACL</i>   <b>any</b> }
<b>Operands</b>	<p><i>MAC_ACL</i> Specifies the source host MAC address for which to set permit conditions. Use the format HHHH.HHHH.HHHH.</p> <p><b>any</b> Specifies any source MAC address.</p> <p><b>count</b> Enables the counting of the packets matching the rule.</p>
<b>Defaults</b>	By default, no MAC ACLs are configured.
<b>Command Modes</b>	Feature Access Control List Configuration mode
<b>Description</b>	Use this command to configure rules to match and to permit traffic based on the source MAC address. You can also enable counters for a specific rule. There are 255 ACL counters supported per port group. Use the <b>no permit</b> command to remove a rule from the MAC ACL.
<b>Usage Guidelines</b>	There are no usage guidelines for this command.
<b>Example</b>	<p>To create a rule in a MAC standard ACL to permit traffic from the source MAC address 0022.3333.4444 and to enable the counting of packets:</p> <pre>switch(conf-macl-std)#<b>permit 0022.3333.4444 count</b></pre> <p>To delete a rule from a MAC standard ACL:</p> <pre>switch(conf-macl-std)#<b>no permit 0022.3333.4444</b></pre>
<b>See Also</b>	<b>mac-access-list extended, no seq</b>



## resequence access-list mac

Specifies the renumbering of the rules in a MAC ACL.

<b>Synopsis</b>	<b>resequence access-list mac</b> { <i>name</i>   <i>seq_num</i>   <i>increment</i> }
<b>Operands</b>	<p><i>name</i> Specifies the name of a standard or an extended MAC ACL.</p> <p><i>seq_num</i> Specifies the starting sequence number in the MAC ACL. The range of valid values is 1-65535.</p> <p><i>increment</i> Specifies a value to increment the sequence number between rules. The range of valid values is 1-65535.</p>
<b>Defaults</b>	There are no default configurations for this command.
<b>Command Modes</b>	Privileged EXEC mode
<b>Description</b>	Use this command to reassign sequence numbers to entries of an existing MAC access-list.
<b>Usage Guidelines</b>	Reordering the sequence numbers is useful when you need to insert rules into an existing MAC ACL and there are not enough sequence numbers available. When all sequence numbers between rules are exhausted, this feature allows the reassigning of new sequence numbers to entries of an existing access list.
<b>Example</b>	<p>To reorder the rules in a MAC ACL:</p> <pre> switch#show running-config access-list mac test ! mac access-list standard test  seq 1 permit 0011.2222.3333  seq 2 permit 0011.2222.4444  seq 3 permit 0011.2222.5555  seq 4 deny 0011.2222.6666 !  switch#resequence access-list mac test 10 10  switch#show running-config access-list mac test ! mac access-list standard test  seq 10 permit 0011.2222.3333  seq 20 permit 0011.2222.4444  seq 30 permit 0011.2222.5555  seq 40 deny 0011.2222.6666 ! </pre>
<b>See Also</b>	<b>mac-access-list extended, seq</b>

## seq (extended MAC ACLs)

Inserts a rule anywhere in the MAC ACL.

<b>Synopsis</b>	<b>seq</b> <i>value</i> {deny   permit} {any   host <i>MAC_ACL</i>   <i>MAC_ACL</i> } {any   host <i>MAC_ACL</i>   <i>MAC_ACL</i> } [ <i>EtherType</i>   arp   fcoe   ipv4] [count]	
	<b>no seq</b> <i>value</i>	
<b>Operands</b>	<i>value</i>	Specifies the sequence number for the rule. The range of valid values is 0-65535.
	<b>permit or deny</b>	Specifies rules to permit or deny traffic.
	<b>any</b>	Specifies any source MAC address.
	<b>host <i>MAC_ACL</i></b>	Specifies the source host MAC address for which to set permit or deny conditions. Use the format HHHH.HHHH.HHHH.
	<i>MAC_ACL</i>	Specifies the source host MAC address for which to set permit or deny conditions. Use the format HHHH.HHHH.HHHH.
	<b>any</b>	Specifies any destination MAC address.
	<b>host <i>MAC_ACL</i></b>	Specifies the destination host address for which to set permit or deny conditions. Use the format HHHH.HHHH.HHHH.
	<i>MAC_ACL</i>	Specifies the destination host address for which to set permit or deny conditions. Use the format HHHH.HHHH.HHHH.
	<i>Ethertype</i>	Specifies the protocol number for which to set the permit or deny conditions. The range of valid values is 1536-65535.
	<b>arp</b>	Specifies to permit or deny the Address Resolution Protocol (0x0806).
	<b>fcoe</b>	Specifies to permit or deny the Fibre Channel over Ethernet Protocol (0x8906).
	<b>ipv4</b>	Specifies to permit or deny the IPv4 protocol (0x0800).
	<b>count</b>	Enables the counting of the packets matching the rule.
<b>Defaults</b>	By default, no MAC ACLs are configured.	
<b>Command Modes</b>	Feature Access Control List Configuration mode	
<b>Description</b>	Use this command to insert a rule anywhere in the MAC ACL; it configures rules to match and permits or drops traffic based on the source and destination MAC addresses, and the protocol type. You can also enable counters for a specific rule. There are 255 ACL counters supported per port group. Use the <b>no seq <i>value</i></b> command to remove a rule from the MAC ACL.	
<b>Usage Guidelines</b>	The first set of {any   host <i>MAC_ACL</i>   <i>MAC_ACL</i> } parameters is specific to the source MAC address. The second set of {any   host <i>MAC_ACL</i>   <i>MAC_ACL</i> } parameters is specific to the destination MAC address.	

**Example** To create a rule in a MAC extended ACL to permit or drop IPv4 traffic from the source MAC address 0022.3333.4444 to the destination MAC address 0022.3333.5555 and to enable the counting of packets:

```
switch(conf-macl-ext)#seq 100 deny 0022.3333.4444 0022.3333.5555 ipv4 count
switch(conf-macl-ext)#seq 1000 permit 0022.3333.4444 0022.3333.5555 ipv4 count
```

To delete a rule from a MAC extended ACL:

```
switch(conf-macl-ext)#no seq 100
```

**See Also** deny, permit, resequence

## seq (standard MAC ACLs)

Inserts a rule anywhere in the MAC ACL.

<b>Synopsis</b>	<b>seq</b> <i>value</i> {deny   permit} {any   host <i>MAC_ACL</i>   <i>MAC_ACL</i> } [ <b>count</b> ]	
	<b>no seq</b> <i>value</i>	
<b>Operands</b>	<i>value</i>	Specifies the sequence number for the rule. The range of valid values is 0-65535.
	<b>permit or deny</b>	Specifies rules to permit or deny traffic.
	<b>any</b>	Specifies any source MAC address.
	<b>host <i>MAC_ACL</i></b>	Specifies the source host MAC address for which to set permit or deny conditions. Use the format HHHH.HHHH.HHHH.
	<i>MAC_ACL</i>	Specifies the source host MAC address for which to set permit or deny conditions. Use the format HHHH.HHHH.HHHH.
	<b>count</b>	Enables the counting of the packets matching the rule.
<b>Defaults</b>	By default, no MAC ACLs are configured.	
<b>Command Modes</b>	Feature Access Control List Configuration mode	
<b>Description</b>	Use this command to configure rules to match and permit or drop traffic based on source and destination MAC address and protocol type. You can also enable counters for a specific rule. There are 255 ACL counters supported per port group. Use the <b>no seq <i>value</i></b> command to remove a rule from the MAC ACL.	
<b>Usage Guidelines</b>	There are no usage guidelines for this command.	
<b>Example</b>	To create a rule in a MAC standard ACL to permit or to drop traffic from the source MAC address 0022.3333.4444 and to enable the counting of packets:	
	<pre>switch(conf-macl-std)#seq 100 deny 0022.3333.4444 count switch(conf-macl-std)#seq 1000 permit 0022.3333.4444 count</pre>	
	To delete a filter rule in a MAC standard ACL:	
	<pre>switch(conf-macl-std)#no seq 100</pre>	
<b>See Also</b>	deny, permit, resequence	

## show mac access-group

Displays the current MAC ACL mapping to interfaces.

<b>Synopsis</b>	<b>show mac access-group</b> [ <b>interface</b> <i>port-channel</i> <i>number</i>   <b>tengigabitethernet</b> <i>slot/port</i>   <b>vlan</b> <i>vlan_id</i> ]
<b>Operands</b>	<p><b>interface</b> Specifies the interface for which to display the MAC ACL mapping.</p> <p><b>port-channel</b> <i>number</i> Specifies the port-channel number. The range of valid values is 1–63.</p> <p><b>tengigabitethernet</b> Specifies a valid 10 Gbps Ethernet interface.</p> <p><i>slot</i> Specifies a valid slot number.</p> <p><i>port</i> Specifies a valid port number.</p> <p><b>vlan</b> <i>vlan_id</i> Specifies the VLAN number. The range of valid values is 1-3583.</p>
<b>Defaults</b>	There are no default configurations for this command.
<b>Command Modes</b>	EXEC mode
<b>Description</b>	Use this command to display the current MAC ACL mapping to interfaces.
<b>Usage Guidelines</b>	If you do not specify an interface, this command shows the mapping of MAC ACL to all interfaces.
<b>Examples</b>	<p>To display the current MAC ACL mapping for 10 Gbps Ethernet interface 0/1:</p> <pre>switch#show mac access-group interface tengigabitethernet 0/1 Interface Te 0/1   Inbound access-list is std_acl</pre> <p>To display the current MAC ACL mapping for interface VLAN 100:</p> <pre>switch#show mac access-group interface vlan 100 Interface Vl 100   Inbound access-list is ext_acl</pre> <p>To display the current MAC ACL mapping for 10 Gbps Ethernet interface 0/7 where there is no ACL applied:</p> <pre>switch#show mac access-group interface tengigabitethernet 0/7 Interface Te 0/7   Inbound access-list is not set</pre>
<b>See Also</b>	<b>show running-config, show statistics</b>

## show statistics access-list mac

Shows active ACL rules in the switch and if the rules have counters enabled.

<b>Synopsis</b>	<b>show statistics access-list mac</b> <i>name</i> [ <b>interface</b> <i>port-channel number</i>   <b>tengigabitethernet</b> <i>slot/port</i>   <b>vlan</b> <i>vlan_id</i> ]
<b>Operands</b>	<p><i>name</i> Specifies a unique name for the MAC ACL.</p> <p><b>interface</b> Specifies the interface for which to display the statistics.</p> <p style="padding-left: 2em;"><b>port-channel</b> <i>number</i> Specifies the port-channel number. The range of valid values is 1–63.</p> <p style="padding-left: 2em;"><b>tengigabitethernet</b> Specifies a valid 10 Gbps Ethernet interface.</p> <p style="padding-left: 2em;"><i>slot</i> Specifies a valid slot number.</p> <p style="padding-left: 2em;"><i>port</i> Specifies a valid port number.</p> <p><b>vlan</b> <i>vlan_id</i> <b>Specifies the VLAN number. The range of valid values is 1-3583.</b></p>
<b>Defaults</b>	There are no default configurations for this command.
<b>Command Modes</b>	EXEC mode
<b>Description</b>	Use this command to display the active rules on the switch and whether those rules have counters enabled.
<b>Examples</b>	<p>To display the statistics for standard and extended MAC ACL applied on two interfaces tengigabitethernet 0/1 and VLAN 100:</p> <pre>switch#show statistics access-list mac std_acl mac access-list standard std_acl on interface Te 0/1   seq 10 deny 0011.2222.3333 count (6312 frames)   seq 20 deny 0011.2222.4444 count (20 frames)   seq 30 deny 0011.2222.5555   seq 40 deny 0011.2222.6666 count (100000 frames)  switch#show statistics access-list mac ext_acl mac access-list extended ext_acl on interface Vl 100   seq 10 deny 0011.2222.2222 0022.2222.2222 ipv4 count (4350 frames)   seq 20 deny 0011.2222.2222 0022.2222.2222 fcoe count (0 frames)   seq 30 deny 0011.2222.2222 0022.2222.2222 arp   seq 40 deny 0011.2222.2222 0022.2222.2222 10000 count (560 frames)</pre> <p>If the rule is not written into the hardware the output displays as shown below:</p> <pre>seq 8 permit 00c0.e000.0080 count (unwritten)</pre> <p>If the rule is written into the hardware, but the counters are not enabled for that rule, the output displays as shown below:</p> <pre>seq 9 permit 00c0.e000.0090 count (uncounted)</pre>
<b>See Also</b>	<b>show running-config, show mac access-group</b>

# Spanning Tree Protocol Commands

---

## bridge-priority

Specifies the priority of the bridge.

**Synopsis**    **bridge-priority** *priority*  
**no bridge-priority**

**Operands**    *priority*                      Specifies the bridge priority. The range of valid values is 0-61440.

**Defaults**    The default priority is 32678.

**Command Modes**    Protocol Spanning Tree mode

**Description**    Use this command to set the bridge priority for the common instance. Using a lower priority value indicates that the bridge might become root. Use the **no bridge-priority** command to return to the default settings.

**Usage Guidelines**    This command must be used to specify the priority of the bridge. The priority values can be set only in increments of 4096.

**Examples**    To specify the bridge priority:

```
switch#configure terminal
switch(config)#protocol spanning-tree stp
switch(conf-stp)#bridge-priority 8192

switch#configure terminal
switch(config)#protocol spanning-tree rstp
switch(conf-rstp)#bridge-priority 8192

switch#configure terminal
switch(config)#protocol spanning-tree mstp
switch(conf-mstp)#bridge-priority 8192
```

**see Also**    **protocol spanning-tree**

**cisco-interoperability**

Configures the switch to interoperate with some legacy Cisco switches.

<b>Synopsis</b>	<b>cisco-interoperability</b> [ <b>disable</b>   <b>enable</b> ]	
<b>Operands</b>	<b>disable</b>	Disables Cisco interoperability for the Multiple Spanning Tree Protocol (MSTP) switch.
	<b>enable</b>	Enables Cisco interoperability for the MSTP switch.
<b>Defaults</b>	Cisco interoperability is disabled.	
<b>Command Modes</b>	Protocol Spanning Tree MSTP mode	
<b>Description</b>	Use this command to enable or disable the switch to interoperate with some legacy Cisco switches. For some switches, the MSTP field <b>Version 3 Length</b> does not adhere to the current standards.	
<b>Usage Guidelines</b>	If Cisco interoperability is required on any switch in the network, then all switches in the network must be compatible, and therefore enabled using this command for interoperability with a Cisco switch.	
<b>Examples</b>	To enable Cisco interoperability on a switch: <pre>switch#configure terminal switch(config)#protocol spanning-tree mstp switch(conf-mstp)#cisco-interoperability enable</pre> <p>To disable Cisco interoperability on a switch:</p> <pre>switch#configure terminal switch(config)#protocol spanning-tree mstp switch(conf-mstp)#cisco-interoperability disable</pre>	
<b>See Also</b>	none	



## clear spanning-tree counter

Clears all spanning-tree counters on the interface.

<b>Synopsis</b>	<b>clear spanning-tree counter</b> [ <b>interface</b>   <b>port-channel</b> <i>number</i>   <b>tengigabitethernet</b> <i>slot/port</i> ]
<b>Operands</b>	<p><b>interface</b> Specifies the interface on which to clear the spanning-tree counters.</p> <p><b>port-channel</b> <i>number</i> Specifies the port-channel number. The range of valid values is 1-63.</p> <p><b>tengigabitethernet</b> Specifies a valid 10 Gbps Ethernet interface.</p> <p><i>slot</i> Specifies a valid slot number.</p> <p><i>port</i> Specifies a valid port number.</p>
<b>Defaults</b>	There are no default configurations for this command.
<b>Command Modes</b>	Privileged EXEC mode
<b>Description</b>	Use this command to clear the spanning-tree counters on the interface.
<b>Usage Guidelines</b>	If the <b>interface</b> operand is not specified, spanning-tree counters are cleared for all interfaces.
<b>Examples</b>	<p>To clear spanning-tree counters for all interfaces:</p> <pre>switch#clear spanning-tree counter</pre> <p>To clear spanning-tree counters for a 10 Gbps Ethernet interface:</p> <pre>switch#clear spanning-tree counter interface tengigabitethernet 0/1</pre> <p>To clear spanning-tree counters for port-channel 23:</p> <pre>switch#clear spanning-tree counter interface port-channel 23</pre>
<b>See Also</b>	<b>show spanning-tree</b>

## debug spanning-tree

Enables debugging for the Spanning Tree Protocol.

<b>Synopsis</b>	<b>debug spanning-tree</b> {all   bpdud {rx   tx {all   interface port-channel <i>number</i>   tengigabitethernet <i>slot/port</i> } }	
	<b>no debug spanning-tree</b> {all   bpdud {rx   tx {all   interface port-channel <i>number</i>   tengigabitethernet <i>slot/port</i> } }	
<b>Operands</b>	<b>all</b>	Turns on spanning tree packet debugging on all interfaces.
	<b>bpdud</b>	Turns on Bridge Protocol Data Unit debugging.
	<b>rx</b>	Turns on debugging for only received spanning-tree packets.
	<b>tx</b>	Turns on debugging for only transmitted spanning-tree packets.
	<b>interface port-channel</b> <i>number</i>	Specifies the port-channel interface. The range of valid values is 1-63.
	<b>interface tengigabitethernet</b>	Specifies the 10 Gbps Ethernet interface.
	<i>slot</i>	Specifies the slot number.
	<i>port</i>	Specifies the port number.
<b>Defaults</b>	By default debugging is not turned on.	
<b>Command Modes</b>	Privileged EXEC mode	
<b>Description</b>	Use this command to enable debugging for the Spanning Tree Protocol. Use the <b>no debug</b> command to disable debugging.	
<b>Usage Guidelines</b>	To display debugging outputs on a particular cmsh session, use the <b>terminal monitor</b> command.	
<b>Examples</b>	To enable debugging of spanning-tree for both Rx and Tx on 10 Gbps Ethernet interface 0/1:	
	<pre>switch#debug spanning-tree bpdud rx interface tengigabitethernet 0/1 switch#debug spanning-tree bpdud tx interface tengigabitethernet 0/1 switch#show debug spanning-tree MSTP debugging status: Spanning-tree rx debugging is off Te 0/1 rx is on Spanning-tree tx debugging is off Te 0/1 tx is on</pre>	
<b>See Also</b>	show debug spanning-tree, show debug	

## error-disable-timeout enable

Enables the timer to bring the interface out of the error-disabled state.

<b>Synopsis</b>	<b>error-disable-timeout enable</b>
<b>Operands</b>	none
<b>Defaults</b>	There are no default configurations for this command.
<b>Command Modes</b>	Protocol Spanning Tree mode
<b>Description</b>	Use this command to enable the timer to bring the interface out of the disabled state.
<b>Usage Guidelines</b>	<p>When the Spanning Tree Protocol (STP) Bridge Protocol Data Unit (BPDU) guard disables a port, the port remains in the disabled state unless the port is enabled manually. This command allows you to enable the interface from the disabled state.</p>
<b>Examples</b>	<p>To bring the interface out of the disabled state:</p> <pre>switch(conf-rstp)#error-disable-timeout enable</pre>
<b>See Also</b>	<b>error-disable-timeout interval</b>

## error-disable-timeout interval

<b>Synopsis</b>	<b>error-disable-timeout interval</b> <i>seconds</i>
<b>Operands</b>	<i>seconds</i> Specifies the range of time in seconds for the interface to time out. The range of valid values is 10-1000000.
<b>Defaults</b>	The default is 300 seconds. The timeout feature is disabled.
<b>Command Modes</b>	Protocol Spanning Tree mode
<b>Description</b>	Use this command to set the interface to time out when an error occurs.
<b>Usage Guidelines</b>	There are no usage guidelines for this command.
<b>Examples</b>	To set the timeout value to 10 seconds: <pre>switch(conf-rstp)#<b>error-disable-timeout interval 10</b></pre>
<b>See Also</b>	<b>error-disable-timeout enable</b>

## forward-delay

Specifies the time an interface spends in each of the listening and learning states.

<b>Synopsis</b>	<b>forward-delay</b> <i>seconds</i> <b>no forward-delay</b>
<b>Operands</b>	<i>seconds</i> Specifies the range of time in seconds that an interface spends in the Spanning Tree Protocol (STP) learning and listening states. The range of valid values is 4-30.
<b>Defaults</b>	The default is 15 seconds.
<b>Command Modes</b>	Protocol Spanning Tree mode
<b>Description</b>	Use this command to specify how long the listening and learning states last before the interface begins the forwarding of all spanning-tree instances. Use the <b>no forward-delay</b> command to return to the default settings.
<b>Note</b>	STP interface states: <ul style="list-style-type: none"> <li>• Listening - The interface processes the Bridge Protocol Data Units (BPDUs) and awaits possible new information that might cause it to return to the blocking state.</li> <li>• Learning - The interface does not yet forward frames (packets), instead it learns source addresses from frames received and adds them to the filtering database (switching database).</li> <li>• Forwarding - An interface receiving and sending data, normal operation. STP still monitors incoming BPDUs that can indicate it should return to the blocking state to prevent a loop.</li> <li>• Blocking - An interface that can cause a switching loop, no user data is sent or received, but it might go to the forwarding state if the other links in use fail and the STP determines that the interface may transition to the forwarding state. BPDU data continues to be received in the blocking state.</li> </ul>
<b>Usage Guidelines</b>	When you change the spanning-tree forward-delay time, it affects all spanning-tree instances. When configuring the forward-delay, the following relationship should be kept: $2 * (\text{forward-delay} - 1) \geq \text{max-age} \geq 2 * (\text{hello-time} + 1)$
<b>Examples</b>	To configure the forward-delay time to 18 seconds: <pre>switch(conf-mstp) #forward-delay 18</pre>
<b>See Also</b>	<b>hello-time, max age</b>

## hello-time

Sets the interval between the hello Bridge Protocol Data Units (BPDUs) sent on an interface.

<b>Synopsis</b>	<b>hello-time</b> <i>seconds</i> <b>no hello-time</b>
<b>Operands</b>	<i>seconds</i> Specifies the time range in seconds for the interval between the hello BPDUs sent on an interface. The range of valid values is 1-10.
<b>Defaults</b>	The default is 2 seconds.
<b>Command Modes</b>	Protocol Spanning Tree mode
<b>Description</b>	Use this command to configure the spanning-tree bridge hello time, which determines how often the device broadcasts hello messages to other devices. Use the <b>no hello-time</b> command to return to the default settings.
<b>Usage Guidelines</b>	When configuring the <b>hello-time</b> , the <b>max-age</b> setting must be greater than the <b>hello-time</b> setting. The following relationship should be kept: $2 * (\text{forward-delay} - 1) \geq \text{max-age} \geq 2 * (\text{hello-time} + 1)$
<b>Examples</b>	To configure spanning-tree bridge hello time to 5 seconds: <pre>switch(conf-stp) #hello-time 5</pre>
<b>See Also</b>	<b>forward-delay, max-age</b>

## instance

Maps a VLAN to a Multiple Spanning Tree Protocol (MSTP) instance.

<b>Synopsis</b>	<b>instance</b> <i>instance_id</i> [ <b>vlan</b> <i>vlan_id</i>   <b>priority</b> <i>priority_id</i> ] <b>no instance</b>
<b>Operands</b>	<i>instance_id</i> Specifies the MSTP instance. The range of valid values is 1-15. <b>vlan</b> <i>vlan_id</i> Specifies the VLAN to map an MSTP instance. The range of valid values is 1-3583. <b>priority</b> <i>priority_id</i> Specifies the priority for the specified instance. The range of valid values is 0-61440. The priority values can be set only in increments of 4096.
<b>Defaults</b>	The default priority value is 32768.
<b>Command Modes</b>	Protocol Spanning Tree MSTP mode
<b>Description</b>	Use this command to map a VLAN to an MTSP instance. You can group a set of VLANs to an instance. This command can be used only after the VLAN is defined. Use the <b>no instance</b> command to unmap the VLAN from the MSTP instance.
<b>Usage Guidelines</b>	The following rules apply: <ul style="list-style-type: none"><li>• VLANs must be created before mapping to instances.</li><li>• VLAN instance mapping is removed from the configuration if the underlying VLANs are deleted.</li></ul>
<b>Examples</b>	To map a VLAN to an MTSP instance: <pre>switch(conf-mstp)#instance 1 vlan 2, 3 switch(conf-mstp)#instance 2 vlan 4-6 switch(conf-mstp)#instance 1 priority 4096</pre>
<b>See Also</b>	<b>show spanning-tree</b>

**max-age**

Sets the interval time in seconds between messages that the spanning tree receives from the interface.

<b>Synopsis</b>	<b>max-age</b> <i>seconds</i> <b>no max-age</b>
<b>Operands</b>	<i>seconds</i> Configures the Spanning tree Protocol interface maximum-age. The range of valid values is 6-40.
<b>Defaults</b>	The default is 20 seconds.
<b>Command Modes</b>	Protocol Spanning Tree mode
<b>Description</b>	Use this command to control the maximum length of time that passes before an interface saves its configuration Bridge Protocol Data Unit (BPDU) information. Use the <b>no max-age</b> command to return to the default configuration.
<b>Usage Guidelines</b>	When configuring the maximum age, the <b>max-age</b> setting must be greater than the <b>hello-time</b> setting. The following relationship should be kept: $2 * (\text{forward-delay} - 1) \geq \text{max-age} \geq 2 * (\text{hello-time} + 1)$
<b>Examples</b>	To configure the maximum-age to 10 seconds: <pre>switch(conf-rstp) #<b>max-age</b> 10</pre>
<b>See Also</b>	<b>hello-time, forward delay</b>



## max-hops

Configures the maximum number of hops for a Bridge Protocol Data Unit (BPDU) in an MSTP region.

<b>Synopsis</b>	<b>max-hops</b> <i>hop_count</i> <b>no max-hops</b>
<b>Operands</b>	<i>hop_count</i> Specifies the maximum number of hops for which the BPDU will be valid. The range of valid values is 1-40.
<b>Defaults</b>	The default is 20 hops.
<b>Command Modes</b>	Protocol Spanning Tree MSTP mode
<b>Description</b>	Use this command to configure the maximum number of hops for a BPDU in an MSTP region. This parameter is used by all the instances of the MSTP. Use the <b>no max-hops</b> command to return to the default value.
<b>Usage Guidelines</b>	Specifying the maximum hops for a BPDU prevents the messages from looping indefinitely on the interface. When you change the number of hops, it affects all spanning-tree instances.
<b>Examples</b>	To set the number of maximum hops to 25 for all MSTPs: <pre>switch(config)#<b>protocol spanning-tree mstp</b> switch(conf-mstp)#<b>max-hops 25</b></pre>
<b>See Also</b>	<b>show spanning-tree mst</b>

**port-channel path-cost**

Sets the path-cost behavior.

**Synopsis** `port-channel path-cost custom | standard`

**Operands**

<i>custom</i>	Specifies to use the custom behavior, which sets the path-cost changes according to the port-channel's bandwidth.
<i>standard</i>	Specifies to use the standard behavior, which sets that the path-cost does not change according to port-channel's bandwidth.

**Defaults** The default path-cost is standard.

**Command Modes** Protocol Spanning Tree mode

**Description** Use this command to set the path-cost behavior for the port-channel.

**Usage Guidelines** There are no usage guidelines for this command.

**Examples** To set the behavior for the path-cost to custom:

```
switch(conf-mstp)#port-channel path-cost custom
```

To set the behavior for the path-cost to standard:

```
switch(conf-mstp)#port-channel path-cost standard
```

**See Also** none

## protocol spanning-tree

<b>Synopsis</b>	<code>protocol spanning-tree [mstp   rstp   stp]</code> <code>no protocol spanning-tree</code>						
<b>Operands</b>	<table><tr><td><code>mstp</code></td><td>Specifies the Multiple Spanning Tree Protocol (MSTP).</td></tr><tr><td><code>rstp</code></td><td>Specifies the Rapid Spanning Tree (RSTP).</td></tr><tr><td><code>stp</code></td><td>Specifies the Spanning Tree Protocol (STP).</td></tr></table>	<code>mstp</code>	Specifies the Multiple Spanning Tree Protocol (MSTP).	<code>rstp</code>	Specifies the Rapid Spanning Tree (RSTP).	<code>stp</code>	Specifies the Spanning Tree Protocol (STP).
<code>mstp</code>	Specifies the Multiple Spanning Tree Protocol (MSTP).						
<code>rstp</code>	Specifies the Rapid Spanning Tree (RSTP).						
<code>stp</code>	Specifies the Spanning Tree Protocol (STP).						
<b>Defaults</b>	By default, STP is not enabled. STP is not required in a loop-free topology.						
<b>Command Modes</b>	Global configuration mode						
<b>Description</b>	Use this command to create a context for the protocol specified. Use the <b>no protocol spanning-tree</b> command to delete the context and all the configurations defined within the context or protocol for the interface.						
<b>Usage Guidelines</b>	<p>Consider enabling STP to detect or avoid loops. You must turn off one form of STP before turning on another form.</p> <p>Packet drops or packet flooding may occur if you do not enable xSTP on all devices connected on both sides of parallel links.</p>						
<b>Examples</b>	To enable the Spanning Tree Protocol: <pre>switch(config)#<b>protocol spanning-tree stp</b></pre>						
<b>See Also</b>	<code>show spanning-tree</code>						

## region

Specifies the Multiple Spanning Tree Protocol (MSTP) region.

<b>Synopsis</b>	<b>region</b> <i>region-name</i> <b>no region</b>
<b>Operands</b>	<i>region-name</i> Assigns a name to an MSTP region.
<b>Defaults</b>	There are no default configurations for this command.
<b>Command Modes</b>	Protocol Spanning Tree MSTP mode
<b>Description</b>	Use this command to assign a name to an MSTP region. Use the <b>no region</b> command to delete the name.
<b>Usage Guidelines</b>	The <i>region-name</i> string has a maximum length of 32 characters and is case-sensitive.
<b>Examples</b>	To assign a name to an MSTP region named brocade1: <pre>switch(config)#<b>protocol spanning-tree mstp</b> switch(conf-mstp)#<b>region brocade1</b></pre>
<b>See Also</b>	<b>revision, show spanning-tree</b>

## revision

Assigns a version number to the Multiple Spanning Tree Protocol (MSTP) configuration.

<b>Synopsis</b>	<b>revision</b> <i>number</i> <b>no revision</b>
<b>Operands</b>	<i>number</i> Specifies the revision or version number of the MSTP region. The range of valid values is 0-255.
<b>Defaults</b>	The default is 0.
<b>Command Modes</b>	Protocol Spanning Tree MSTP mode
<b>Description</b>	Use this command to specify the configuration revision number. Use the <b>no revision</b> command to return to the default setting.
<b>Usage Guidelines</b>	There are no usage guidelines for this command.
<b>Examples</b>	To set the configuration revision to 1: <pre>switch(config)#<b>protocol spanning-tree mstp</b> switch(conf-mstp)#<b>revision 1</b></pre>
<b>See Also</b>	<b>region, show spanning-tree</b>

**show spanning-tree**

Displays all Spanning Tree Protocol information.

<b>Synopsis</b>	<b>show spanning-tree</b>
<b>Operands</b>	none
<b>Defaults</b>	There are no default configurations for this command.
<b>Command Modes</b>	EXEC mode
<b>Description</b>	Use this command to display all STP information.
<b>Usage Guidelines</b>	There are no usage guidelines for this command.
<b>Examples</b>	To display all STP information:

```
switch#show spanning-tree
Spanning-tree Mode: Multiple Spanning Tree Protocol

CIST Root Id: 8000.0005.1e76.1aa0 (self)
CIST Bridge Id: 8000.0005.1e76.1aa0
CIST Reg Root Id: 8000.0005.1e76.1aa0 (self)

CIST Root Forward Delay: 15; Hello Time: 2; Max Age: 20; Max-hops: 20
Configured Forward Delay: 15; Hello Time: 2; Max Age: 20; Max-hops: 20;
Tx-HoldCount: 6
Number of topology change(s): 0

Bpdu-guard errdisable timeout: disabled
Bpdu-guard errdisable timeout interval: 300 sec
Migrate Time: 3 sec

Port Te 0/0 enabled
  IfIndex: 67108864; Id: 8000; Role: Disabled; State: Discarding
  Designated External Path Cost: 0; Internal Path Cost 0
  Configured Path Cost: 2000
  Designated Port Id: 0; CIST Priority: 128
  Designated Bridge: 0000.0000.0000.0000
  CIST Port Hello Time: 2
  Number of forward-transitions: 0
  Version Multiple Spanning Tree Protocol - Received None - Send MSTP
  Edgeport: off; AutoEdge: no; AdminEdge: no; EdgeDelay: 3 sec
  Configured Root guard: off; Operational Root guard: off
  Boundary: yes
  Bpdu-guard: off
  Bpdu-filter: off
  Link-type: point-to-point
  Received BPDUs: 0; Sent BPDUs: 0

Port Te 0/8 enabled
  IfIndex: 67633408; Id: 8008; Role: Disabled; State: Discarding
  Designated External Path Cost: 0; Internal Path Cost 0
  Configured Path Cost: 2000
```

```
Designated Port Id: 0; CIST Priority: 128
Designated Bridge: 0000.0000.0000.0000
CIST Port Hello Time: 2
Number of forward-transitions: 0
Version Multiple Spanning Tree Protocol - Received None - Send MSTP
Edgeport: off; AutoEdge: no; AdminEdge: no; EdgeDelay: 3 sec
Configured Root guard: off; Operational Root guard: off
Boundary: yes
Bpdu-guard: off
Bpdu-filter: off
Link-type: point-to-point
Received BPDUs: 0; Sent BPDUs: 0

Port Te 0/19 enabled
IfIndex: 68354563; Id: 8013; Role: Disabled; State: Discarding
Designated External Path Cost: 0; Internal Path Cost 0
Configured Path Cost: 2000
Designated Port Id: 0; CIST Priority: 128
Designated Bridge: 0000.0000.0000.0000
CIST Port Hello Time: 2
Number of forward-transitions: 0
Version Multiple Spanning Tree Protocol - Received None - Send MSTP
Edgeport: off; AutoEdge: no; AdminEdge: no; EdgeDelay: 3 sec
Configured Root guard: off; Operational Root guard: off
Boundary: yes
Bpdu-guard: off
Bpdu-filter: off
Link-type: point-to-point
Received BPDUs: 0; Sent BPDUs: 0

Port Te 0/20 enabled
IfIndex: 68420100; Id: 8014; Role: Disabled; State: Discarding
Designated External Path Cost: 0; Internal Path Cost 0
Configured Path Cost: 2000
Designated Port Id: 0; CIST Priority: 128
Designated Bridge: 0000.0000.0000.0000
CIST Port Hello Time: 2
Number of forward-transitions: 0
Version Multiple Spanning Tree Protocol - Received None - Send MSTP
Edgeport: off; AutoEdge: no; AdminEdge: no; EdgeDelay: 3 sec
Configured Root guard: off; Operational Root guard: off
Boundary: yes
Bpdu-guard: off
Bpdu-filter: off
Link-type: point-to-point
Received BPDUs: 0; Sent BPDUs: 0
```

**See Also**    **show spanning-tree interface**

## show spanning-tree brief

Displays the status and parameters of the Spanning Tree Protocol.

- Synopsis**     **show spanning-tree brief**
- Operands**    none
- Defaults**    There are no default configurations for this command.
- Command Modes**   EXEC mode
- Description**   Use this command to display the status and parameters of the Spanning Tree Protocol. It includes the port roles and port states. The following describes the port roles and states:
  - Port roles—root port, designated port, alternate port and backup port.
  - Port states—discarding, learning, and forwarding.
  - Port types—edge port (PortFast), point-to-point, and shared port.
- Usage Guidelines**   There are no usage guidelines for this command.
- Examples**       To display the status and parameters of the Spanning Tree Protocol:

```
switch#show spanning-tree brief
Spanning-tree Mode: Rapid Spanning Tree Protocol

      Root ID          Priority 32768
                Address 0005.1e76.1aa0
                Hello Time 2, Max Age 20, Forward Delay 15

      Bridge ID       Priority 32768
                Address 0005.1e76.1aa0
                Hello Time 2, Max Age 20, Forward Delay 15, Tx-HoldCount 6
                Migrate Time 3 sec
```

Interface	Role	Sts	Cost	Prio	Link-type	Boundary	Edge
Te 0/0	DIS	DSC	2000	128	P2P	Yes	No
Te 0/1	ALT	BLK	2000	128	P2P	Yes	No
Te 0/2	RTPT	BLK	2000	128	P2P	Yes	No
Te 0/3	DIS	BLK	2000	128	P2P	Yes	No
Te 0/8	DIS	DSC	2000	128	P2P	Yes	No
Te 0/19	DIS	DSC	2000	128	P2P	Yes	No
Te 0/20	DIS	DSC	2000	128	P2P	Yes	No

**See Also**     **show spanning-tree interface**



## show spanning-tree interface

Displays the state of the Spanning Tree Protocol for all named port-channels or 10 Gbps Ethernet interfaces.

<b>Synopsis</b>	<b>show spanning-tree interface</b> [ <b>port-channel</b> <i>number</i>   <b>tengigabitethernet</b> <i>slot/port</i> ]
<b>Operands</b>	<p><b>port-channel</b> <i>number</i> Specifies the port-channel number. The range of valid values is 1-63.</p> <p><b>tengigabitethernet</b> Specifies a valid 10 Gbps Ethernet interface.</p> <p style="padding-left: 2em;"><i>slot</i> Specifies a valid slot number.</p> <p style="padding-left: 2em;"><i>port</i> Specifies a valid port number.</p>
<b>Defaults</b>	There are no default configurations for this command.
<b>Command Modes</b>	EXEC mode
<b>Description</b>	Use this command to display the state of the spanning tree for all named port-channels or 10 Gbps Ethernet interfaces.
<b>Usage Guidelines</b>	<p>The following describes the port roles, states and types:</p> <ul style="list-style-type: none"> <li>• Port roles—root port, designated port, alternate port and backup port.</li> <li>• Port states—discarding, learning, and forwarding.</li> <li>• Port types—edge port (PortFast), point-to-point, and shared port.</li> </ul>
<b>Examples</b>	<p>To display information on a 10 Gbps Ethernet interface:</p> <pre>switch#show spanning-tree interface tengigabitethernet 0/0 Spanning-tree Mode: Rapid Spanning Tree Protocol  Root Id: 8000.0005.1e76.1aa0 (self) Bridge Id: 8000.0005.1e76.1aa0  Port Te 0/0 enabled   IfIndex: 67108864; Id: 8000; Role: Disabled; State: Discarding   Designated Path Cost: 0   Configured Path Cost: 2000   Designated Port Id: 0; Port Priority: 128   Designated Bridge: 0000.0000.0000.0000   Number of forward-transitions: 0   Version Rapid Spanning Tree Protocol - Received None - Send RSTP   Edgeport: off; AutoEdge: no; AdminEdge: no; EdgeDelay: 3 sec   Configured Root guard: off; Operational Root guard: off   Boundary: yes   Bpdu-guard: off   Bpdu-filter: off   Link-type: point-to-point   Received BPDUs: 0; Sent BPDUs: 0</pre>
<b>See Also</b>	<b>show spanning-tree brief</b>

## show spanning-tree mst brief

Displays the status and parameters of the Multiple Spanning Tree Protocol (MSTP) instance information in brief.

- Synopsis**     **show spanning-tree mst brief**
- Operands**    none
- Defaults**    There are no default configurations for this command.
- Command Modes**   EXEC mode
- Description**   Use this command to display the status and parameters of the Multiple Spanning Tree Protocol (MSTP) instance information. It includes the port roles, port states and port types.
- Usage Guidelines**
  - The following describes the port roles, states, and types:
  - Port roles—root port, designated port, alternate port, and backup port.
  - Port states—discarding, learning, and forwarding.
  - Port types—edge port (PortFast), point-to-point, and shared port.
- Examples**     To display the status and parameters of the MSTP instance information:

```

switch#show spanning-tree mst brief

Spanning-tree Mode: Multiple Spanning Tree Protocol

CIST Root ID          Priority 32768
                    Address 0005.1e76.1aa0
CIST Bridge ID       Priority 32768
                    Address 0005.1e76.1aa0
CIST Regional Root ID Priority 32768
                    Address 0005.1e76.1aa0

Configured Hello Time 2, Max Age 20, Forward Delay 15
Max Hops 20, Tx-HoldCount 6
CIST Root Hello Time 2, Max Age 20, Forward Delay 15, Max Hops 20
CIST Root path cost 0

Interface     Role   Sts   Cost       Prio   Link-type       Boundary   Edge
-----
Te 0/0       DIS   DSC   2000       128   P2P            Yes       No
Te 0/1       ALT   BLK   2000       128   P2P            Yes       No
Te 0/2       RTPT  BLK   2000       128   P2P            Yes       No
Te 0/3       DIS   BLK   2000       128   P2P            Yes       No
Te 0/8       DIS   DSC   2000       128   P2P            Yes       No
Te 0/19      DIS   DSC   2000       128   P2P            Yes       No
Te 0/20      DIS   DSC   2000       128   P2P            Yes       No
    
```

**See Also**     **show spanning-tree mst interface, show spanning-tree mst instance**

## show spanning-tree mst detail

Displays details on an interface for the Multiple Spanning Tree Protocol (MSTP) instance running.

<b>Synopsis</b>	<b>show spanning-tree mst detail</b> [ <b>interface port-channel</b> <i>number</i>   <b>interface tengigabitethernet</b> <i>slot/port</i> ]
<b>Operands</b>	<p><b>interface</b> Specifies the interface for which to display the spanning-tree information.</p> <p><b>port-channel</b> <i>number</i> Specifies the port-channel of the interface. The range of valid values is 1-63.</p> <p><b>tengigabitethernet</b> Specifies a valid 10 Gbps Ethernet interface.</p> <p><i>slot</i> Specifies a valid slot number.</p> <p><i>port</i> Specifies a valid port number.</p>
<b>Defaults</b>	There are no default configuration for this command.
<b>Command Modes</b>	EXEC mode
<b>Description</b>	Use this command to display details on a specified interface for the MSTP instance running.
<b>Usage Guidelines</b>	There are no usage guidelines for this command.
<b>Examples</b>	To display MSTP information on the switch in detail:

```
switch#show spanning-tree mst detail

Spanning-tree Mode: Multiple Spanning Tree Protocol

CIST Root Id: 8000.0005.1e76.1aa0 (self)
CIST Bridge Id: 8000.0005.1e76.1aa0
CIST Reg Root Id: 8000.0005.1e76.1aa0 (self)

CIST Root Forward Delay: 15; Hello Time: 2; Max Age: 20; Max-hops: 20
Configured Forward Delay: 15; Hello Time: 2; Max Age: 20; Max-hops: 20;
Tx-HoldCount: 6
Number of topology change(s): 0

Bpdu-guard errdisable timeout: disabled
Bpdu-guard errdisable timeout interval: 300 sec
Migrate Time: 3 sec

CIST Port Details.
=====
Instance: 0; Vlans:1, 100

Port Te 0/0 enabled
  IfIndex: 67108864; Id: 8000; Role: Disabled; State: Discarding
  Designated External Path Cost: 0; Internal Path Cost 0
  Configured Path Cost: 2000
  Designated Port Id: 0; CIST Priority: 128
```

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```
Designated Bridge: 0000.0000.0000.0000
CIST Port Hello Time: 2
Number of forward-transitions: 0
Version Multiple Spanning Tree Protocol - Received None - Send MSTP
Edgeport: off; AutoEdge: no; AdminEdge: no; EdgeDelay: 3 sec
Configured Root guard: off; Operational Root guard: off
Boundary: yes
Bpdu-guard: off
Bpdu-filter: off
Link-type: point-to-point
Received BPDUs: 0; Sent BPDUs: 0

Port Te 0/8 enabled
IfIndex: 67633408; Id: 8008; Role: Disabled; State: Discarding
Designated External Path Cost: 0; Internal Path Cost 0
Configured Path Cost: 2000
Designated Port Id: 0; CIST Priority: 128
Designated Bridge: 0000.0000.0000.0000
CIST Port Hello Time: 2
Number of forward-transitions: 0
Version Multiple Spanning Tree Protocol - Received None - Send MSTP
Edgeport: off; AutoEdge: no; AdminEdge: no; EdgeDelay: 3 sec
Configured Root guard: off; Operational Root guard: off
Boundary: yes
Bpdu-guard: off
Bpdu-filter: off
Link-type: point-to-point
Received BPDUs: 0; Sent BPDUs: 0

Port Te 0/19 enabled
IfIndex: 68354563; Id: 8013; Role: Disabled; State: Discarding
Designated External Path Cost: 0; Internal Path Cost 0
Configured Path Cost: 2000
Designated Port Id: 0; CIST Priority: 128
Designated Bridge: 0000.0000.0000.0000
CIST Port Hello Time: 2
Number of forward-transitions: 0
Version Multiple Spanning Tree Protocol - Received None - Send MSTP
Edgeport: off; AutoEdge: no; AdminEdge: no; EdgeDelay: 3 sec
Configured Root guard: off; Operational Root guard: off
Boundary: yes
Bpdu-guard: off
Bpdu-filter: off
Link-type: point-to-point
Received BPDUs: 0; Sent BPDUs: 0

Port Te 0/20 enabled
IfIndex: 68420100; Id: 8014; Role: Disabled; State: Discarding
Designated External Path Cost: 0; Internal Path Cost 0
Configured Path Cost: 2000
Designated Port Id: 0; CIST Priority: 128
Designated Bridge: 0000.0000.0000.0000
CIST Port Hello Time: 2
Number of forward-transitions: 0
Version Multiple Spanning Tree Protocol - Received None - Send MSTP
Edgeport: off; AutoEdge: no; AdminEdge: no; EdgeDelay: 3 sec
Configured Root guard: off; Operational Root guard: off
Boundary: yes
Bpdu-guard: off
Bpdu-filter: off
```

```
Link-type: point-to-point  
Received BPDUs: 0; Sent BPDUs: 0
```

```
MSTI details.  
=====
```

**See Also**    **show spanning-tree mst interface, show spanning-tree mst instance**

## show spanning-tree mst instance

Displays information on a specified Multiple Spanning Tree Protocol (MSTP) instance.

<b>Synopsis</b>	<b>show spanning-tree mst instance</b> <i>instance_id</i> [ <b>interface port-channel</b> <i>number</i>   <b>interface tengigabitethernet</b> <i>slot/port</i> ]
<b>Operands</b>	<p><i>instance_id</i> Specifies the MSTP instance for which to display information. The range of valid values is 1-15.</p> <p><b>interface</b> Specifies the interface for which to display the MSTP instance information.</p> <p><b>port-channel</b> <i>number</i> Specifies the port-channel of the interface. The range of valid values is 1-63.</p> <p><b>tengigabitethernet</b></p> <p style="padding-left: 2em;"><i>slot</i> Specifies a valid slot number for the interface for which to display information on the MSPT instance.</p> <p style="padding-left: 2em;"><i>port</i> Specifies a valid port number for the interface for which to display information on the MSPT instance.</p>
<b>Defaults</b>	There are no default configurations for this command.
<b>Command Modes</b>	EXEC mode
<b>Description</b>	Use this command to display information on a specified instance of the MSTP.
<b>Usage Guidelines</b>	There are no usage guidelines for this command.
<b>Examples</b>	<p>To display information on MSTP instance 1:</p> <pre>switch#show spanning-tree mst instance 1 interface tengigabitethernet 0/0  Instance: 1; VLANs: 100 MSTI Root Id: 8001.0005.1e76.1aa0 (self) MSTI Bridge Id: 8001.0005.1e76.1aa0 MSTI Bridge Priority: 32768</pre>
<b>See Also</b>	<b>show spanning-tree mst brief, show spanning-tree interface</b>

## show spanning-tree mst interface

Displays information for a specified interface for a Multiple Spanning Tree Protocol (MSTP) instance.

<b>Synopsis</b>	<b>show spanning-tree mst interface</b> [ <b>port-channel</b> <i>number</i> ] <b>tengigabitethernet</b> <i>slot/port</i> ]
<b>Operands</b>	<p><b>port-channel</b> <i>number</i></p> <p>Specifies the port-channel of the interface. The range of valid values is 1-63.</p> <p><b>tengigabitethernet</b></p> <p>Specifies a valid 10 Gbps Ethernet interface.</p> <p><i>slot</i></p> <p>Specifies a valid slot number for the interface for which to display information for the MSTP instance.</p> <p><i>port</i></p> <p>Specifies a valid port number for the interface for which to display information for the MSTP instance.</p>
<b>Defaults</b>	There are no default configurations for this command.
<b>Command Modes</b>	EXEC mode
<b>Description</b>	Use this command to display MSTP protocol specific information such as Common and Internal Spanning Tree (CIST) spanning-tree related information, information to each MSTP instance (MSTI), and the state of the port specific to each MSTI.
<b>Usage Guidelines</b>	There are no usage guidelines for this command.
<b>Examples</b>	To display information for the MSTP interface:

```
switch#show spanning-tree mst interface tengigabitethernet 0/0
Spanning-tree Mode: Multiple Spanning Tree Protocol

CIST Root Id: 8000.0005.1e76.1aa0 (self)
CIST Bridge Id: 8000.0005.1e76.1aa0
CIST Reg Root Id: 8000.0005.1e76.1aa0 (self)

CIST Operational Port Hello Time: 0
Number of forward-transitions: 0
Version: Multiple Spanning Tree Protocol - Received None - Send MSTP
Edgeport: off; AutoEdge: no; AdminEdge: no; EdgeDelay: 3 sec
Configured Root guard: off; Operational Root guard: off
Boundary: yes
Bpdu-guard: off
Bpdu-filter: off
Link-type: point-to-point
Received BPDUs: 0; Sent BPDUs: 0

Instance      Role  Sts  Cost      Prio  VLANs
-----
0             DIS   DSC   2000      128   1
```

**See Also** **show spanning-tree brief, show spanning-tree mst brief**

## shutdown

Disables the Multiple Spanning Tree Protocol (MSTP), Rapid Spanning Tree (RSTP), or the Spanning Tree Protocol (STP) globally.

<b>Synopsis</b>	<b>shutdown</b> <b>no shutdown</b>
<b>Operands</b>	none
<b>Defaults</b>	STP is not required in a loop-free topology and is not enabled by default.
<b>Command Modes</b>	Protocol Spanning Tree mode
<b>Description</b>	Use this command to disable the MSTP, RSTP, or STP protocol globally.
<b>Usage Guidelines</b>	This command has no usage guidelines.
<b>Examples</b>	To disable STP globally: <pre>switch(config)#<b>protocol spanning-tree rstp</b> switch(conf-rstp)#<b>shutdown</b></pre> To enable STP globally: <pre>switch(config)#<b>protocol spanning-tree rstp</b> switch(conf-rstp)#<b>no shutdown</b></pre>
<b>See Also</b>	none



## spanning-tree autoedge

Enables automatic edge detection.

**Synopsis**     **spanning-tree autoedge**  
              **no spanning-tree autoedge**

**Operands**    none

**Defaults**    Auto detection is not enabled.

**Command Modes**   Interface configuration mode

**Description**     Use this command to automatically identify the edge port.

**Usage Guidelines**   The port can become an edge port if no Bridge Protocol Data Unit (BPDU) is received.

**Examples**        To enable automatic edge detection:  
                    switch(conf-if-te-0/1)#**spanning-tree autoedge**

**See Also**        **protocol spanning-tree**

## spanning-tree cost

Changes an interface's spanning-tree port path cost.

**.Synopsis** `spanning-tree cost cost`

**Operands** `cost` Specifies the path cost for the Spanning Tree Protocol (STP) calculations. The range of valid values is 1-200000000.

**Defaults** The default path cost is 200000000.

**Command Modes** Interface configuration mode

**Description** Use this command to configure the path cost for spanning-tree calculations.

**Usage Guidelines** Lower path cost indicates a greater chance of becoming root.

**Examples** To set the port cost to 128:

```
switch(conf-if-te-0/1)#spanning-tree cost 128
```

**See Also** `show spanning-tree`

## spanning-tree edgeport

Enables the edge port on an interface to allow the interface to quickly transition to the forwarding state.

<b>Synopsis</b>	<b>spanning-tree edgeport [bpdu-filter   bpdu-guard]</b>
<b>Operands</b>	<p><b>bpdu-filter</b>                Sets the edge port Bridge Protocol Data Unit (BPDU) filter for the port.</p> <p><b>bpdu-guard</b>                Guards the port against the reception of BPDUs.</p>
<b>Defaults</b>	Edge port is disabled.
<b>Command Modes</b>	Interface configuration mode
<b>Description</b>	Use this command to enable the edge port feature. This command is only for RSTP and MSTP. Use the <b>spanning-tree portfast</b> command for STP.
<b>Usage Guidelines</b>	<p>Note the following details about edge ports and their behavior:</p> <ul style="list-style-type: none"> <li>• A port can become an edge port if no BPDU is received.</li> <li>• When an edge port receives a BPDU, it becomes a normal spanning-tree port and is no longer an edge port.</li> <li>• Because ports directly connected to end stations cannot create bridging loops in the network, edge ports directly transition to the forwarding state, and skip the listening and learning states</li> </ul>
<b>Examples</b>	<p>To enable a port to quickly transition to the forwarding state:</p> <pre>switch(conf-if-te-0/1)#spanning-tree edgeport</pre> <p>To set the edgeport BPDU filter for the port:</p> <pre>switch(conf-if-te-0/1)#spanning-tree edgeport bpdu-filter</pre> <p>To guard the port against reception of BPDUs:</p> <pre>switch(conf-if-te-0/1)#spanning-tree edgeport bpdu-guard</pre>
<b>See Also</b>	<b>spanning-tree portfast bpdu-guard, spanning-tree autoedge</b>

## spanning-tree guard root

Enables the guard root to restrict which interface is allowed to be the spanning-tree root port or the path-to-the root for the switch.

<b>Synopsis</b>	<b>spanning-tree guard root</b> <b>no spanning-tree guard root</b>
<b>Operands</b>	none
<b>Defaults</b>	Guard root is disabled.
<b>Command Modes</b>	Interface configuration mode
<b>Description</b>	Use this command to enable the guard root on the interface. Use the <b>no spanning-tree guard root</b> command to disable guard root on the selected interface.
<b>Usage Guidelines</b>	The root port provides the best path from the switch to the root switch.
<b>Note</b>	Guard root protects the root bridge from malicious attacks and unintentional misconfigurations where a bridge device that is not intended to be the root bridge becomes the root bridge. This causes severe bottlenecks in the datapath. Guard root ensures that the port on which it is enabled is a designated port. If the guard root enabled port receives a superior Bridge Protocol Data Unit (BPDU), it goes to a discarding state.
<b>Examples</b>	To enable guard root: <pre>switch(conf-if-te-0/1)#<b>spanning-tree guard root</b></pre>
<b>See Also</b>	<b>spanning-tree cost</b>

## spanning-tree hello-time

Configures the hello-time in seconds on the interface.

<b>Synopsis</b>	<b>spanning-tree hello-time</b> <i>seconds</i> <b>no spanning-tree hello-time</b>
<b>Operands</b>	<i>seconds</i> Sets the interval between the hello Bridge Protocol Data Units (BPDUs) sent by the root switch configuration messages. The range of valid values 1-10.
<b>Defaults</b>	The default is 2 seconds.
<b>Command Modes</b>	Interface configuration mode
<b>Description</b>	Use this command to set the interval time between the BPDUs sent by the root switch. Use the <b>no spanning-tree hello-time</b> command to return to the default setting. This command is only for MSTP.
<b>Usage Guidelines</b>	Changing the <b>hello-time</b> affects all spanning-tree instances. The <b>max-age</b> setting must be greater than the <b>hello-time</b> setting.
<b>Examples</b>	To set the hello time to 5 seconds: <pre>switch(config-if-te-0/1)#spanning-tree hello-time 5</pre>
<b>See Also</b>	<b>forward-delay, max-age, show spanning-tree</b>

## spanning-tree instance

Sets restrictions for the port of particular MSTP instance.

<b>Synopsis</b>	<b>spanning-tree instance</b> <i>instance_id</i> [ <b>cost</b> <i>cost</i>   <b>priority</b> <i>priority</i>   <b>restricted-role</b>   <b>restricted-tcn</b> ]	
	<b>no spanning-tree instance</b> <i>instance_id</i> [ <b>cost</b> <i>cost</i>   <b>priority</b> <i>priority</i>   <b>restricted-role</b>   <b>restricted-tcn</b> ]	
<b>Operands</b>	<i>instance_id</i>	Specifies the MSTP instance. The range of valid values is 1-15.
	<b>cost</b> <i>cost</i>	Specifies the path-cost for a port. The range of valid values is 1-20000000.
	<b>priority</b> <i>priority</i>	Specifies the port priority for a bridge in increments of 16. The range of valid values is 0-240.
	<b>restricted-role</b>	Specifies to restrict the role of a port.
	<b>restricted-tcn</b>	Specifies to restrict the propagation of the topology change notifications from a port.
<b>Defaults</b>	The default path-cost value is 2000 on a 10 Gbps Ethernet interface.	
<b>Command Modes</b>	Interface configuration mode	
<b>Description</b>	Use this command to set restrictions for a port on a particular MSTP instance.	
<b>Usage Guidelines</b>	Use this command for MSTP-specific configurations.	
<b>Examples</b>	To set restrictions for the port of MSTP instance 1 with the cost of 40000: <pre>switch(conf-if-te-0/1)#spanning-tree instance 1 cost 40000</pre>	
<b>See Also</b>	instance, show spanning-tree	

## spanning-tree link-type

Enables and disables the rapid transition for the Spanning Tree Protocol.

<b>Synopsis</b>	<b>spanning-tree link-type</b> [point-to-point   shared] <b>no spanning-tree link-type</b>
<b>Operands</b>	<b>point-to-point</b> Enables rapid transition. <b>shared</b> Disables rapid transition.
<b>Defaults</b>	The default is point-to-point.
<b>Command Modes</b>	Interface configuration mode
<b>Description</b>	Use this command to specify a link type for the Spanning Tree Protocol.
<b>Usage Guidelines</b>	This command overrides the default setting of the link type.
<b>Examples</b>	To specify the link type as shared: <pre>switch(config-if-te-0/0)#spanning-tree link-type shared</pre>
<b>See Also</b>	<b>spanning-tree link-type shared, no spanning-tree link-type</b>

## spanning-tree portfast

Enables the Port Fast feature on an interface to allow the interface to quickly transition to forwarding state.

<b>Synopsis</b>	<b>spanning-tree portfast [bpdu-filter   bpdu-guard]</b>	
<b>Operands</b>	<b>bpdu-filter</b>	Sets the Port Fast BPDU filter for the port.
	<b>bpdu-guard</b>	Guards the port against the reception of BPDUs.
<b>Defaults</b>	Port Fast is disabled.	
<b>Command Modes</b>	Interface configuration mode	
<b>Description</b>	Use this command to enable the Port Fast feature. This command is the only for the STP. Port Fast immediately puts the interface into the forwarding state without having to wait for the standard forward time. Use the <b>spanning-tree edgeport</b> command for MSTP and RSTP.	
<b>Usage Guidelines</b>	If you enable <b>portfast bpdu-guard</b> on an interface and the interface receives a BPDU, the software disables the interface and puts the interface in the ERR_DISABLE state.	
<b>Examples</b>	To enable a port to quickly transition to the forwarding state: <pre>switch(conf-if-te-0/1)#spanning-tree portfast</pre>	
	To set the Port Fast BPDU filter for the port: <pre>switch(conf-if-te-0/1)#spanning-tree portfast bpdu-filter</pre>	
	To guard the port against the reception of BPDUs: <pre>switch(conf-if-te-0/1)#spanning-tree portfast bpdu-guard</pre>	
<b>See Also</b>	<b>spanning-tree portfast bpdu-guard, spanning-tree autoedge</b>	



## spanning-tree priority

Changes an interface's spanning-tree port priority.

<b>Synopsis</b>	<code>spanning-tree priority <i>priority</i></code> <code>no spanning-tree priority <i>priority</i></code>
<b>Operands</b>	<i>priority</i> Specifies the interface priority for the spanning tree. The range of valid values is 0-240. Port priority is in increments of 16.
<b>Defaults</b>	The default value is 128.
<b>Command Modes</b>	Interface configuration mode
<b>Description</b>	Use this command to change an interface's spanning-tree port priority. Use the <b>no spanning-tree priority</b> command to return to the default setting.
<b>Usage Guidelines</b>	There are no usage guidelines for this command.
<b>Examples</b>	To configure the port priority to 16: <pre>switch(conf-if-te-0/1)#spanning-tree priority 16</pre>
<b>See Also</b>	<b>spanning-tree cost, show spanning-tree</b>

## spanning-tree restricted-role

Restricts the role of the port from becoming a root port.

**Synopsis** `spanning-tree restricted-role`  
`no spanning-tree restricted-role`

**Operands** none

**Defaults** The restricted role is disabled.

**Command Modes** Interface configuration mode

**Description** Use this command to configure the port from becoming a root port. Use the **no spanning-tree restricted-role** command to return to the default setting.

**Usage Guidelines** There are no usage guidelines for this command.

**Examples** To configure the port from becoming a root port:

```
switch(conf-if-te-0/1)#spanning-tree restricted-role
```

**See Also** `show spanning-tree`

## spanning-tree restricted-tcn

Restricts the topology change notification Bridge Protocol Data Units (BPDUs) sent on the port.

<b>Synopsis</b>	<code>spanning-tree restricted-tcn</code> <code>no spanning-tree restricted-tcn</code>
<b>Operands</b>	none
<b>Defaults</b>	The restricted TCN is disabled.
<b>Command Modes</b>	Interface configuration mode
<b>Description</b>	Use this command to restrict the topology change notification Bridge Protocol Data Units (BPDUs) sent on the port.
<b>Usage Guidelines</b>	There are no usage guidelines for this command.
<b>Examples</b>	To restrict the TCN on a specific interface: <pre>switch(conf-if-te-0/1)#<b>spanning-tree restricted-tcn</b></pre>
<b>See Also</b>	<code>show spanning-tree</code>

## spanning-tree shutdown

Enables or disables spanning tree on the interface.

<b>Synopsis</b>	<b>spanning-tree shutdown</b> <b>no spanning-tree shutdown</b>
<b>Operands</b>	none
<b>Defaults</b>	Spanning tree is not enabled.
<b>Command Modes</b>	Interface configuration mode
<b>Description</b>	<p>Use this command to disable spanning tree on the interface or VLAN. Use the <b>no spanning-tree shutdown</b> command to enable spanning tree on the interface or VLAN.</p> <p>Once all of the interface ports have been configured for a VLAN, you can enable spanning tree protocol (STP) for all members of the VLAN with a single command. Whichever protocol is currently selected is used by the VLAN. Only one type of STP can be active at a time.</p> <p>A physical interface port can be a member of multiple VLANs. For example, a physical port can be a member of VLAN 1002 and VLAN 55 simultaneously. In addition, VLAN 1002 can have STP enabled and VLAN 55 can have STP disabled simultaneously.</p>
<b>Usage Guidelines</b>	There are no usage guidelines for this command.
<b>Examples</b>	<p>To disable spanning tree on a specific interface:</p> <pre>switch(config)#interface tengigabitethernet 0/1 switch(config-if-te-0/1)#spanning-tree shutdown</pre> <p>To enable spanning tree on VLAN 1002:</p> <pre>switch(config)#interface vlan 1002 switch(config-if-vl-1002)#no spanning-tree shutdown</pre>
<b>See Also</b>	<b>protocol spanning-tree</b>

## spanning-tree tc-flush-standard

Flushes the Media Access Control (MAC) address based on the optimal scheme.

<b>Synopsis</b>	<b>spanning-tree tc-flush-standard</b> <b>no spanning-tree tc-flush-standard</b>
<b>Operands</b>	none
<b>Defaults</b>	MAC address flushing is enabled.
<b>Command Modes</b>	Global configuration mode
<b>Description</b>	Use this command to flush the MAC address based on the optimal scheme. Use the <b>no spanning-tree tc-flush-standard</b> command to disable the MAC address flushing.
<b>Usage Guidelines</b>	There are no usage guidelines for this command.
<b>Examples</b>	To disable the MAC address flushing upon receiving any topology change notification: <pre>switch(config)#no spanning-tree tc-flush-standard</pre>
<b>See Also</b>	<b>show spanning-tree brief</b>

## transmit-holdcount

Configures the maximum number of Bridge Protocol Data Units (BPDUs) transmitted per second for the Multiple Spanning Tree Protocol (MSTP) and the Rapid Spanning Tree Protocol RSTP.

<b>Synopsis</b>	<b>transmit-holdcount</b> <i>number</i> <b>no transmit-holdcount</b>
<b>Operands</b>	<i>number</i> Specifies the value in seconds for the number of BPDUs than can be sent before pausing for 1 second. The range of valid values is 1-10.
<b>Defaults</b>	The default is 6.
<b>Command Modes</b>	Protocol Spanning Tree MSTP mode
<b>Description</b>	Use this command to configure the BPDU burst size by changing the transmit hold count value. Use the <b>no transmit-holdcount</b> command to return to the default setting.
<b>Usage Guidelines</b>	There are no usage guidelines for this command.
<b>Examples</b>	To change the number of BPDUs transmitted to 3 seconds: <pre>switch(conf-mstp)#<b>transmit-holdcount</b> 3</pre>
<b>See Also</b>	<b>show spanning-tree mst detail</b>

# Internet Group Management Protocol Commands

---

## clear ip igmp group

Clears information related to learned groups in the IGMP protocol module.

<b>Synopsis</b>	<b>clear ip igmp group</b> [ <i>A.B.C.D</i> ] [ <b>interface tengigabitethernet</b> <i>slot/port</i>   <b>interface port-channel</b> <i>number</i>   <b>interface vlan</b> <i>vlan_id</i> ]   <b>interface tengigabitethernet</b> <i>slot/port</i>   <b>interface port-channel</b> <i>number</i>   <b>interface vlan</b> <i>vlan_id</i> ]	
<b>Operands</b>	<i>A.B.C.D</i>	Specifies the group address, as a subnet number in dotted decimal format (for example, 10.0.0.1), as the allowable range of addresses included in the multicast group.
	<b>interface</b>	Use this keyword to specify any of the following interfaces:
	<b>tengigabitethernet</b>	Specifies a valid 10 Gbps Ethernet interface.
	<i>slot</i>	Specifies a valid slot number.
	<i>port</i>	Specifies a valid port number.
	<b>interface</b>	Use this keyword to specify any of the following interfaces:
	<b>port-channel</b> <i>number</i>	Specifies the interface is a port-channel. The range of valid values is 1-63.
	<b>interface</b>	Use this keyword to specify any of the following interfaces:
	<b>vlan</b> <i>vlan_id</i>	Specifies which VLAN interface to display the snooping configuration related information. The range of valid values is 1-3583.
<b>Defaults</b>	There are no defaults for this command.	
<b>Command Modes</b>	Privileged EXEC mode	
<b>Description</b>	Use this command to clear the group information in the IGMP database, including entries for either a specific group on all interfaces or specific groups on specific interfaces.	
<b>Usage Guidelines</b>	There are no usage guidelines for this command.	
<b>Examples</b>	To clear information for all groups in the IGMP protocol:	
	<pre>switch#clear ip igmp group</pre>	
<b>See Also</b>	none	

## 10 clear ip igmp groups

### clear ip igmp groups

Clears information related to learned groups in the IGMP protocol module.

**Synopsis** clear ip igmp groups

**Operands** none

**Defaults** There are no defaults for this command.

**Command Modes** Privileged EXEC mode

**Description** Use this command to clear all IGMP group information in the IGMP database.

**Usage Guidelines** There are no usage guidelines for this command.

**Examples** To clear information for all groups in the IGMP protocol:

```
switch#clear ip igmp groups
```

**See Also** none



## debug ip igmp all

Displays all IGMP information.

**Synopsis** `debug ip igmp {all | group [A.B.C.D [interface tengigabitethernet slot/port | interface port-channel number | interface vlan vlan_id]]}`

<b>Operands</b>	<b>all</b>	Displays all values.
	<i>A.B.C.D</i>	Specifies the group address, as a subnet number in dotted decimal format (for example, 10.0.0.1), as the allowable range of addresses included in the multicast group.
	<b>interface</b>	Use this keyword to specify any of the following interfaces:
	<b>tengigabitethernet</b>	Specifies a valid 10 Gbps Ethernet interface.
	<i>slot</i>	Specifies a valid slot number.
	<i>port</i>	Specifies a valid port number.
	<b>vlan</b> <i>vlan_id</i>	Specifies which VLAN interface to display the snooping configuration related information. The range of valid values is 1-3583.
	<b>port-channel</b> <i>number</i>	Specifies the interface is a port-channel. The range of valid values is 1-63.
<b>Description</b>	Displays all of the IGMP packets received and sent, and IGMP-host related events.	
<b>Defaults</b>	There are no defaults for this command.	
<b>Command Modes</b>	Privileged EXEC mode	
<b>User Guidelines</b>	There are no user guidelines for this command.	
<b>Example</b>	none	
<b>See Also</b>	none	

## 10 ip igmp last-member-query-interval

### ip igmp last-member-query-interval

Sets the last member query interval.

**Synopsis** `ip igmp last-member-query-interval milliseconds`

**Operands** *milliseconds* Response time in milliseconds. Valid range is 1000 to 25500 milliseconds. Default value is 1000 milliseconds.

**Description** The last member query interval is the amount of time in seconds that the IGMP router waits to receive a response to a group query message.

**Defaults** There are no defaults for this command.

**Command Modes** Privileged EXEC Mode

**User Guidelines** There are no user guidelines for this command.

**Example** none

**See Also** none

## ip igmp query-interval

Sets the query interval.

**Synopsis** `ip igmp query-interval seconds`

**Operands** `seconds` Response time in seconds. Valid range is 1 to 18000 seconds. Default value is 125 seconds.

**Description** The query interval is the amount of time in seconds between IGMP query messages sent by the switch.

**Defaults** There are no defaults for this command.

**Command Modes** Privileged EXEC Mode

**User Guidelines** There are no user guidelines for this command.

**Example** none

**See Also** none

## 10 ip igmp query-max-response-time

### ip igmp query-max-response-time

Sets the query-max-response-time.

**Synopsis** `ip igmp query-max-response-time seconds`

**Operands** `seconds` Response time in seconds. Valid range is 1 to 25 seconds. Default value is 10 seconds.

**Description** When a host receives the query packet, it starts counting to a random value, less than the maximum response time. When this timer expires, the switch replies with a report, provided that no other host has responded yet.

**Defaults** There are no defaults for this command.

**Command Modes** Privileged EXEC Mode

**User Guidelines** There are no user guidelines for this command.

**Example** none

**See Also** none

## ip igmp snooping enable (global version)

Enables the Internet Group Management Protocol (IGMP) snooping for all VLAN interfaces.

<b>Synopsis</b>	<b>ip igmp snooping enable</b> <b>no ip igmp snooping enable</b>
<b>Operands</b>	none
<b>Defaults</b>	IGMP snooping is globally disabled.
<b>Command Modes</b>	Global Configuration mode
<b>Description</b>	Use this command to enable or disable the Internet Group Management Protocol (IGMP) snooping globally. Use the <b>no ip igmp snooping enable</b> command to return to the default setting.
<b>Usage Guidelines</b>	This command performs IGMP snooping at the interface level.
<b>Examples</b>	To enable igmp globally: <pre>switch(config)# ip igmp snooping enable</pre>
<b>See Also</b>	<b>show ip igmp snooping, ip igmp snooping enable (VLAN version)</b>

## 10 ip igmp snooping enable (VLAN version)

### ip igmp snooping enable (VLAN version)

Enables the Internet Group Management Protocol (IGMP) snooping for a specific VLAN interface.

<b>Synopsis</b>	<b>ip igmp snooping enable</b> <b>no ip igmp snooping enable</b>
<b>Operands</b>	none
<b>Defaults</b>	When snooping is enabled globally, IGMP snooping enabled on all VLAN interfaces.
<b>Command Modes</b>	Privileged EXEC Mode
<b>Description</b>	Use this command to enable or disable the Internet Group Management Protocol (IGMP) snooping on a specific VLAN interface.
<b>Usage Guidelines</b>	This command performs IGMP snooping at the VLAN interface level.
<b>Examples</b>	To enable igmp for a specific VLAN interface, enter Interface VLAN mode and execute the following command: <pre>switch#ip igmp snooping enable</pre>
<b>See Also</b>	<b>show ip igmp snooping, ip igmp snooping enable (global version)</b>

## ip igmp snooping fast-leave

Enables snooping fast-leave.

**Synopsis**    **ip igmp snooping fast-leave**  
              **no ip igmp snooping fast-leave**

**Operands**    none

**Description**    IGMP snooping fast-leave processing allows the removal of an interface from the forwarding-table without sending out group specific queries to the interface.

**Defaults**    This mode is disabled by default.

**Command Modes**    Global Configuration mode

**User Guidelines**    Use **no ip igmp snooping fast-leave** to disable this function.

**Example**    none

**See Also**    none

## ip igmp snooping mrouter

Configures a VLAN port member to be a multicast router interface.

<b>Synopsis</b>	<b>ip igmp snooping mrouter</b> { <b>interface tengigabitethernet</b> <i>slot/port</i>   <b>interface port-channel</b> <i>number</i> }
	<b>no ip igmp snooping mrouter</b> { <b>interface tengigabitethernet</b> <i>slot/port</i>   <b>interface port-channel</b> <i>number</i> }
<b>Operands</b>	<b>interface</b> Use this keyword to specify any of the following interfaces:
	<b>tengigabitethernet</b> Specifies a valid 10 Gbps Ethernet interface.
	<i>slot</i> Specifies a valid slot number.
	<i>port</i> Specifies a valid port number.
	<b>port-channel</b> <i>number</i> Specifies the interface is a port-channel. The range of valid values is 1-63.
<b>Defaults</b>	There are no default configurations for this command.
<b>Command Modes</b>	Privileged EXEC Mode
<b>Description</b>	Use this command to configure a VLAN port member to be a multi-router port.
<b>Usage Guidelines</b>	Use the <b>no ip igmp snooping mrouter</b> version of this command to return to the default setting.
<b>Examples</b>	To configure a VLAN port member to be a multicast router interface. <pre>switch#ip igmp snooping mrouter interface tengigabitethernet 0/1</pre>
<b>See Also</b>	<b>show ip igmp snooping mrouter</b>



## ip igmp snooping mrouter-timeout

Configures the mrouter-time-out

**Synopsis** `ip igmp snooping mrouter-timeout seconds`

**Operands** `seconds` Timeout time in seconds. Valid range is 1 to 60000 seconds. Default value is 300 seconds.

**Description** This command sets the timeout range for when multicast router ports are automatically learned.

**Defaults** There are no defaults for this command.

**Command Modes** Privileged EXEC Mode

**User Guidelines** There are no user guidelines for this command.

**Example** none

**See Also** none

## 10 ip igmp snooping querier enable

### ip igmp snooping querier enable

Activates or deactivates the IGMP snooping querier functionality for the VLAN.

<b>Synopsis</b>	<b>ip igmp snooping querier enable</b> <b>no ip igmp snooping querier enable</b>
<b>Operands</b>	none
<b>Defaults</b>	This feature is not enabled by default.
<b>Command Modes</b>	Privileged EXEC Mode
<b>Description</b>	Use this command to activate or deactivate the IGMP snooping querier functionality for the VLAN. Use the <b>no ip igmp snooping querier enable</b> command to return to the default setting.
<b>Usage Guidelines</b>	Use <b>no ip igmp snooping querier enable</b> to disable this command.
<b>Examples</b>	To enable the IGMP snooping querier feature: <pre>switch(conf-if-vl-1)#ip igmp snooping querier enable</pre>
<b>See Also</b>	<b>show ip igmp interface, show ip igmp snooping interface</b>

## ip igmp static-group

Configures the static group membership entries.

**Synopsis** **ip igmp static-group** *A.B.C.D* {**interface** **tengigabitethernet** *slot/port* | **interface** **port-channel** *number*}

**no ip igmp static-group** *A.B.C.D* {**interface** **tengigabitethernet** *slot/port* | **interface** **port-channel** *number*}

**Operands** *A.B.C.D* Specifies the group address, as a subnet number in dotted decimal format (for example, 10.0.0.1), as the allowable range of addresses included in the multicast group.

**interface** Use this keyword to specify any of the following interfaces:

- tengigabitethernet**  
Specifies a valid 10 Gbps Ethernet interface.
- slot*  
Specifies a valid slot number.
- port*  
Specifies a valid port number.
- port-channel** *number*  
Specifies the interface is a port-channel. The range of valid values is 1-63.

**Description** Using **ip igmp static-group**, packets to the group are fast-switched out of the interface, providing that the packets were received on the correct reverse path forwarding (RPF) interface. Static group membership entries are automatically added to the IGMP cache and mroute table.

**Defaults** There are no defaults for this command.

**Command Modes** Privileged EXEC Mode

**User Guidelines** There are no user guidelines for this command.

**Example** none

**See Also** none

## 10 show debug ip igmp

### show debug ip igmp

Displays the IGMP packets received and transmitted, as well as related events.

**Synopsis**     **show debug ip igmp**

**Operands**     none

**Description**   This command displays the IGMP packets received and transmitted.

**Defaults**     There are no defaults for this command.

**Command Modes**   Privileged EXEC mode

**User Guidelines**   There are no user guidelines for this command.

**Example**        none

**See Also**       none

## show ip igmp groups

Displays information related to learned groups in the IGMP protocol module.

<b>Synopsis</b>	<b>show ip igmp groups</b> [ <i>A.B.C.D</i>   <b>detail</b> [[ <b>interface</b> <b>tengigabitethernet</b> <i>slot/port</i>   <b>detail</b> ]] [[ <b>interface</b> <b>port-channel</b> <i>number</i>   <b>detail</b> ]]   [[ <b>interface</b> <b>vlan</b> <i>vlan_id</i>   <b>detail</b> ]]]	
<b>Operands</b>	<i>A.B.C.D</i>	Specifies the group address, as a subnet number in dotted decimal format (for example, 10.0.0.1), as the allowable range of addresses included in the multicast group.
	<b>detail</b>	Displays the IGMPv3 source information.
	<b>interface</b>	Use this keyword to specify any of the following interfaces:
	<b>tengigabitethernet</b>	Specifies a valid 10 Gbps Ethernet interface.
	<i>slot</i>	Specifies a valid slot number.
	<i>port</i>	Specifies a valid port number.
	<b>detail</b>	Displays the IGMPv3 source information.
	<b>interface</b>	Use this keyword to specify any of the following interfaces:
	<b>vlan</b> <i>vlan_id</i>	Specifies which VLAN interface to display the snooping configuration related information. The range of valid values is 1-3583.
	<b>detail</b>	Displays the IGMPv3 source information.
	<b>interface</b>	Use this keyword to specify any of the following interfaces:
	<b>port-channel</b> <i>number</i>	Specifies the interface is a port-channel. The range of valid values is 1-63.
	<b>detail</b>	Displays the IGMPv3 source information.
<b>Defaults</b>	There are no defaults for this command.	
<b>Command Modes</b>	Privileged EXEC mode	
<b>Description</b>	Use this command to display the IGMP database, including configured entries for either all groups on all interfaces, or all groups on specific interfaces, or specific groups on specific interfaces.	
<b>Usage Guidelines</b>	There are no usage guidelines for this command.	
<b>Examples</b>	none	
<b>See Also</b>	none	

## 10 show ip igmp snooping

### show ip igmp snooping

Displays IGMP snooping information.

<b>Synopsis</b>	<b>show ip igmp snooping</b> {[ <b>interface vlan</b> <i>vlan_id</i>   <b>mrouter interface vlan</b> <i>vlan_id</i>   <b>statistics interface vlan</b> <i>vlan_id</i> ]}	
<b>Operands</b>	<b>interface</b>	Use this keyword to specify any of the following interfaces: <b>vlan</b> <i>vlan_id</i> Specifies which VLAN interface to display the snooping configuration related information. The range of valid values is 1-3583.
	<b>mrouter interface</b>	Use this keyword to specify any of the following interfaces: <b>vlan</b> <i>vlan_id</i> Specifies which VLAN interface to display the snooping configuration related information. The range of valid values is 1-3583.
	<b>statistics interface</b>	Use this keyword to specify any of the following interfaces: <b>vlan</b> <i>vlan_id</i> Specifies which VLAN interface to display the snooping configuration related information. The range of valid values is 1-3583.
<b>Defaults</b>	There are no defaults for this command.	
<b>Command Modes</b>	Privileged EXEC mode	
<b>Description</b>	Use this command to display IGMP snooping information, display multicast router port related information for the specified VLAN, or to display snooping statistics for the specified VLAN in the IGMP protocol module.	
<b>Usage Guidelines</b>	There are no usage guidelines for this command.	
<b>Examples</b>	To display information the IGMP snooping information for VLAN 5: <pre>switch#show ip igmp snooping interface vlan 5</pre>	
<b>See Also</b>	none	

## show running-config igmp

Displays the IGMP configuration.

**Synopsis**     **show running-config igmp**

**Operands**    none

**Description**   This command displays the IGMP contents of the currently running configuration. Note that this information may differ from the contents of the actual running-config file.

**Defaults**     There are no defaults for this command.

**Command Modes**   Privileged EXEC mode

**User Guidelines**   There are no user guidelines for this command.

**Example**        none

**See Also**       none

## 10 show running-config igmp



# RMON Commands

---

## rmon alarm

Sets alarm conditions.

**Synopsis** `rmon alarm index snmp_oid interval seconds {absolute | delta} rising-threshold value event number [falling-threshold value event number [owner name] | owner name]`  
`no rmon alarm index [snmp_oid interval seconds {absolute | delta} rising-threshold value event number [falling-threshold value event number [owner name] | owner name]]`

**Operands**

<b>index</b>	Specifies the alarm index. The range of valid values is 1-65535.
<b>snmp_oid</b>	Specifies the MIB object to monitor. The variable must be in the SNMP OID format, for example, 1.3.6.1.2.1.16.1.1.1.5.65535. The object type must be a counter32.
<b>interval seconds</b>	Specifies the alarm sample interval in seconds. The range of valid values is 1-2147483648.
<b>absolute</b>	Sets the sample type as absolute.
<b>delta</b>	Sets the sample type as delta.
<b>rising-threshold value</b>	Specifies the alarm rising threshold. The range of valid values is 0-4294967295.
<b>event number</b>	Specifies the event for the rising alarm. The range of valid values is 1-65535.
<b>falling-threshold value</b>	Specifies the alarm falling threshold. The range of valid values is 0-4294967295.
<b>event number</b>	Specifies the event for the rising alarm. The range of valid values is 1-65535.
<b>owner name</b>	Specifies the identity of the owner. The maximum number of characters is 32.

**Defaults** There are no alarms configured.

**Command Modes** Global configuration mode

**Description** Use this command to set alarm conditions. Use the **no rmon alarm** command to disable the alarm conditions.

**Usage Guidelines** There are no usage guidelines for this command.

**Examples** To set alarm conditions:

## 11 rmon alarm

```
switch(config)#rmon alarm 100 1.3.6.1.2.1.16.1.1.1.5.65535 interval 5 absolute  
rising-threshold 10000 event 100 falling-threshold 1000 event 101 owner admin
```

**See Also** rmon event, show rmon

## rmon collection stats

Collects Ethernet group statistics on an interface.

**Synopsis** `rmon collection stats` *number* [*owner name*]

`no rmon collection stats` *number* [*owner name*]

**Operands** *number* Specifies the RMON collection control index value. The range of valid values is 1-65535.

*owner name* Specifies the identity of the owner.

**Defaults** The collection of RMON statistics is not enabled.

**Command Modes** Interface configuration mode

**Description** Use this command to collect Ethernet group statistics on an interface. Use the **no rmon collection stats** command to disable the collection of statistics.

**Usage Guidelines** There are no usage guidelines for this command.

**Examples** To collect RMON statistics for the owner admin on 10 Gbps Ethernet interface 0/1:

```
switch(config)#interface tengigabitethernet 0/1
switch(conf-if-te-0/1)#rmon collection stats 2 owner admin
```

**See Also** `show rmon statistics`

# 11 rmon event

## rmon event

Adds or removes an event in the RMON event table associated to the RMON alarm number.

**Synopsis** `rmon event index [description word] [log] [owner name] [trap word]`  
`no rmon event index [description word] [log] [owner name] [trap word]`

**Operands**

<i>index</i>	Specifies the RMON event number. The range of valid values is 1-65535.
<i>description word</i>	Specifies a description of the event.
<i>log</i>	Generates an RMON log when an event is triggered.
<i>owner name</i>	Specifies the owner of the event. The maximum number of characters is 32.
<i>trap word</i>	Specifies the SNMP community or string name to identify this trap.

**Defaults** There are no events configured.

**Command Modes** Global configuration mode

**Description** Use this command to add or remove an event in the RMON event table that is associated with an RMON alarm number. Use the **no rmon event** command to remove the event configuration.

**Usage Guidelines** There are no usage guidelines for this command.

**Examples** To configure an RMON event:

```
switch(config)#rmon event 2 log description "My Errorstoday" owner gjack
```

**See Also** `show rmon events`

**show rmon**

Displays the current RMON status on the switch.

<b>Synopsis</b>	<b>show rmon</b> [ <b>alarms</b> [ <i>number</i> ] [ <i>brief</i> ]   <b>events</b> [ <i>number</i> ] [ <i>brief</i> ]   <b>logs</b> [ <i>event_number</i> ]   <b>statistics</b> [ <i>number</i> ] [ <i>brief</i> ] ]	
<b>Operands</b>	<b>alarms</b>	Specifies to display the RMON alarm table.
	<i>number</i>	Specifies the alarm index identification number. The range of valid values is 1-65535.
	<i>brief</i>	Specifies to display a brief summary of the output.
	<b>events</b>	Specifies to display the RMON events table.
	<i>number</i>	Specifies the event index identification number. The range of valid values is 1-65535.
	<i>brief</i>	Specifies to display a brief summary of the output.
	<b>logs</b>	Specifies to display the RMON log table.
	<i>event_number</i>	Specifies the event index identification number. The range of valid values is 1-65535.
	<b>statistics</b>	Specifies to display the statistics identification number.
	<i>number</i>	Specifies the statistics identification number. The range of valid values is 1-65535.
	<i>brief</i>	Specifies a brief summary of the output.
<b>Defaults</b>	There are no default configurations for this command.	
<b>Command Modes</b>	EXEC mode	
<b>Description</b>	Use this command to display the status of the current RMON on the switch.	
<b>Usage Guidelines</b>	There are no usage guidelines for this command.	
<b>Examples</b>	To display the RMON statistics:	

```
switch#show rmon statistics
rmon collection index 4
  Interface index is Id: 67108864 , Name : TenGigabitEthernet 0/0
  Receive Statistics:
    218903 packets, 14015626 bytes, 0 packs dropped
    Multicasts: 218884, Broadcasts: 18

    Under-size : 0, Jabbers: 0, CRC: 0
    Fragments: 0, Collisions: 0
    64 byte pkts: 218722, 65-127 byte pkts: 174
    128-255 byte pkts: 0, 256-511 byte pkts: 6
    512-1023 byte pkts: 0, 1024-1518 byte pkts: 0
    Over 1518-byte pkts(Oversize - Jumbo): 0
```

## 11 show rmon

```
Owner: RMON_SNMP  
Status: ok(1)
```

To display the RMON events:

```
switch#show rmon events  
event Index = 4  
Description "My Description"  
Event type Log & SnmpTrap  
Event community name admin  
Last Time Sent = 00:00:00  
Owner admin
```

**See Also** rmon alarm, rmon event

# QoS Commands

---

## cee

Applies a CEE Provisioning map on an interface.

**Synopsis**    `cee name`

`no cee`

**Operands**    *name*                      Specifies the name of a previously created CEE map. Any existing CEE map must be removed before a new one can be applied.

**Defaults**    There is no CEE Provisioning applied on an interface.

**Command Modes**    Interface configuration mode

**Description**    Use this command to apply a CEE map on an interface. Use the **no cee command** to remove the CEE Provisioning map.

**Usage Guidelines**    The CEE map applied on an interface should exist on the switch.

**Examples**    To apply a CEE map on an interface:

```
switch(conf-if-te-0/1)#cee demo
```

Because the switch does not allow applying a CEE map that does not exist, the following error displays:

```
switch(conf-if-te-0/1)#cee test
% Error: Map does not exist
```

**See Also**    `cee-map`

## cee-map

Enters the CEE map configuration mode. If the CEE map does not exist, it creates the map.

<b>Synopsis</b>	<p><b>cee-map</b> <i>name</i> [<b>precedence</b> <i>number</i>]</p> <p><b>no cee-map</b> <i>name</i></p>
<b>Operands</b>	<p><i>name</i> Specifies a unique name across all of the CEE maps defined within the system. If the specified CEE map does not exist, then it is created. If the specified CEE map already exists, then it is updated and the new mapping automatically propagates to all interfaces bound to the CEE map.</p> <p><b>precedence</b> <i>number</i> Sets the precedence value for controlling the global scheduler policy when there is conflict between multiple CEE maps and non-CEE QoS configurations. The range of valid values is 1-100.</p>
<b>Defaults</b>	The default CEE map precedence value is 1.
<b>Command Modes</b>	Global configuration mode
<b>Description</b>	<p>Use this command create a CEE Map, and then enter the CEE-Map CLI configuration submode for defining the CEE Provisioning Priority Group Table and Priority-to-Priority Group Table.</p> <p>The CEE Map model allows different CEE Provisioning on different interfaces. There is only a single scheduler policy supported across the entire system. For the system to behave to your expectations, all CEE Map and any non-CEE configuration must specify identical scheduler policies, such as the number of Strict Priority queues and Deficit Weighted Round Robin (DWRR) weights. In deployment scenarios where different CEE Map or non-CEE configurations specify conflicting scheduler policies, then the <b>precedence</b> <i>number</i> parameter can be used to select the CEE Map controlling the setting of the global scheduler policy. The global scheduler policy is based on the CEE Map with the highest precedence value.</p> <p>Use the <b>no cee-map</b> <i>name</i> command to delete the specified CEE map. A CEE map can only be deleted if it is not bound to any interface.</p>
<b>Usage Guidelines</b>	All CEE maps take precedence over the non-CEE scheduler policy.
<b>Examples</b>	<p>To create a CEE map:</p> <pre>switch(config)#<b>cee-map</b> test</pre> <p>To delete a CEE map:</p> <pre>switch(config)#<b>no cee-map</b> test</pre> <p>If a CEE map is currently applied on an interface, you cannot delete that CEE map:</p> <pre>switch(config)#<b>no cee-map</b> demo % Error: Map is still activated</pre>
<b>See Also</b>	<b>cee</b> , <b>priority-group-table</b> , <b>priority-table</b>



## priority-group-table

Configures the bandwidth for each Priority Group.

<b>Synopsis</b>	<b>priority-group-table</b> <i>pgid</i> [ <b>weight</b> <i>weight</i> ] [ <b>pf</b> c] <b>no priority-group-table</b> <i>pgid</i>												
<b>Operands</b>	<p><i>pgid</i> Specifies the Priority Group ID (PGID) assigned to a priority group. The range of valid values is 15.0-15.7 for the eight reserved Strict Priority PGIDs.</p> <p><b>weight</b> <i>weight</i> Maps a weight to a Deficit Weighted Round Robin (DWRR) scheduler queue. This parameter is only valid for the DWRR Priority Group. The sum of all DWRR Priority Group weight values must equal 100 percent. The range of valid values is 1-100.</p> <p><b>pf</b>c Enables the Priority-based Flow Control (PFC) for each priority that gets mapped to the Priority Group.</p>												
<b>Defaults</b>	There is no default value for the weight. The PFC is disabled.												
<b>Command Modes</b>	CEE map configuration mode												
<b>Description</b>	<p>Use this command to configure the bandwidth for each Priority Group, to associate a weight to a DWRR scheduler queue, and to enable the PFC.</p> <p>You can define up to eight additional DWRR Priority Groups with the PGID values in the range of 0-7. Strict Priority Groups take priority in order from the lowest PGID value to the highest PGID value, for example, a PGID of 15.0 is a higher priority than a PGID of 15.1 and PGID of 15.1 is higher priority than PGID 15.2.</p> <p>Use the <b>no priority-group-table</b> <i>pgid</i> command to return the Priority Group to the default values. For the Strict Priority Group, the PGID is still valid, but the PFC is disabled. For the DWRR Priority Group, the PGID is no longer valid and is deleted; the PGID can only be deleted when it is not bound to any Priority-to-Priority Group Table entry.</p>												
<b>Usage Guidelines</b>	A PGID value of 15 is a special value, which allows you to configure priorities with no bandwidth limit. The priority groups 15.0-5.7 are pre-defined in the switch.												
<b>Examples</b>	To define the CEE map and configure the bandwidth with the Priority Group, use the values in <a href="#">Table 3</a> .												
	<p><b>TABLE 3 Bandwidth allocation to user priority groups</b></p> <table border="1"> <thead> <tr> <th>PGID</th> <th>PG%</th> <th>PFC</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>50</td> <td>Y</td> <td>SAN</td> </tr> <tr> <td>1</td> <td>50</td> <td>N</td> <td>LAN</td> </tr> </tbody> </table> <pre>switch(config)#cee-map test switch(conf-ceemap)#priority-group-table 0 weight 50 pfc switch(conf-ceemap)#priority-group-table 1 weight 50</pre>	PGID	PG%	PFC	Description	0	50	Y	SAN	1	50	N	LAN
PGID	PG%	PFC	Description										
0	50	Y	SAN										
1	50	N	LAN										
<b>See Also</b>	<b>cee-map, priority-table, show qos</b>												

## priority-table

Provisions the CEE Priority-to-Priority Group Table, this table maps each of the eight ingress CoS into a Priority Group.

**Synopsis** `priority-table pgid0 pgid1 pgid2 pgid3 pgid4 pgid5 pgid6 pgid7`

`no priority-table`

<b>Operands</b>	<code>pgid0</code>	Sets the Priority Group ID for all packets with CoS 0.
	<code>pgid1</code>	Sets the Priority Group ID for all packets with CoS 1.
	<code>pgid2</code>	Sets the Priority Group ID for all packets with CoS 2.
	<code>pgid3</code>	Sets the Priority Group ID for all packets with CoS 3.
	<code>pgid4</code>	Sets the Priority Group ID for all packets with CoS 4.
	<code>pgid5</code>	Sets the Priority Group ID for all packets with CoS 5.
	<code>pgid6</code>	Sets the Priority Group ID for all packets with CoS 6.
	<code>pgid7</code>	Sets the Priority Group ID for all packets with CoS 7.

**Defaults** The default CEE Priority mapping table matches the IEEE 802.1Q recommendation for systems supporting eight traffic classes. The 802.1Q maps CoS 0 (best effort) to Strict Priority Traffic Class 1 (PGID 15.6) and CoS 1 to below best effort Traffic Class 0 (PGID 15.7). All other CoS values go through unchanged, for example CoS 2 maps to Traffic Class 2 (PGID 15.5), up to CoS 7 and Traffic Class 7 (PGID 15.0).

**Command Modes** CEE Map Configuration mode

**Description** Use this command to provision the CEE Priority-to-Priority Group Table. This table maps each of the eight ingress CoS into a Priority Group. Use the **no priority-table** command to return the Priority mapping table to the default values.

**Usage Guidelines** Only a single CoS can be mapped to a PFC-enabled priority queue. The CoS number must be identical to the priority queue number. If your configuration violates this restriction an error message displays and the Priority Group Table is set back to the default values.

When the CEE map is applied, and the interface is connected to the CNA, only one strict priority PGID (PGID 15.0 to PGID 15.7) is allowed.

**Examples** To define a CEE map of the incoming Priority-to-Priority Groups, use the values in [Table 4](#).

**TABLE 4 Mapping of incoming Priority-to-Priority Groups**

Priority	PGID
0	1
1	1
2	0
3	1
4	1

**TABLE 4** Mapping of incoming Priority-to-Priority Groups

Priority	PGID
5	1
6	1
7	15.0

```
switch(config)#ceemap test
switch(conf-ceemap)#priority-table 1 1 0 1 1 1 1 15.0
```

**See Also**    **cee, cee-map, priority-group-table**

## qos cos

Specifies the interface Class of Service (CoS) value.

<b>Synopsis</b>	<b>qos cos</b> <i>value</i> <b>no qos cos</b>
<b>Operands</b>	<i>value</i> Specifies the CoS value. The range of valid values is 0-7.
<b>Defaults</b>	The default CoS value is 0 (zero).
<b>Command Modes</b>	Interface configuration mode
<b>Description</b>	Use this command to specify the interface Default CoS value. When Interface ingress QoS Trust is in the untrusted mode, then the Interface Default CoS value is applied to all ingress traffic for user priority mapping. When the interface ingress QoS Trust is in the CoS mode, then the Interface Default CoS value is applied to all non-priority tagged ingress traffic for user priority mapping. Use the <b>no qos cos</b> command to return the CoS value to the default.
<b>Usage Guidelines</b>	If the interface is QoS trusted, the CoS value of the interface is used to assign a CoS value to all untagged packets entering the interface.
<b>Examples</b>	To set the interface CoS value to 2: <pre>switch(conf-if-te-0/2)#<b>qos cos 2</b></pre> To return the interface CoS value to the default: <pre>switch(conf-if-te-0/2)#<b>no qos cos</b></pre>
<b>See Also</b>	<b>show qos, qos map, qos trust</b>

## qos cos-mutation

Applies a CoS-to-CoS (COS) mutation QoS map on an interface.

<b>Synopsis</b>	<b>qos cos-mutation</b> <i>name</i> <b>no qos cos-mutation</b>
<b>Operands</b>	<i>name</i> Specifies the name of the CoS mutation map.
<b>Defaults</b>	There is no explicit CoS-to-CoS mutation QoS map applied; by default the inbound CoS equals the outbound CoS.
<b>Command Modes</b>	Interface configuration mode
<b>Description</b>	Use this command to apply a CoS-to-CoS mutation QoS map on an interface.
<b>Usage Guidelines</b>	This command applies a CoS-to-CoS mutation map on an interface. The <b>qos cos-mutation</b> command is not available if the interface is in CEE Provisioning mode. Use the <b>no qos cos-mutation</b> command to remove the CoS-to-CoS mutation map.
<b>Examples</b>	To activate the CoS-to-CoS mutation QoS map on the interface: <pre>switch(conf-if-te-0/1)#qos cos-mutation test</pre> To remove the CoS-to-CoS mutation QoS map on the interface: <pre>switch(conf-if-te-0/1)#no qos cos-mutation</pre>
<b>See Also</b>	<b>qos map cos-mutation, show qos maps</b>

**qos cos-traffic-class**

Applies a CoS-to-Traffic Class QoS map on an interface.

<b>Synopsis</b>	<b>qos cos-traffic-class</b> <i>name</i>
	<b>no qos cos-traffic-class</b>
<b>Operands</b>	<i>name</i> Specifies the name of a previously created CoS-to-Traffic Class QoS map. Only one CoS-to-Traffic Class QoS map can exist at a time. An existing CoS-to-Traffic Class QoS map must be removed before a new one can be applied.
<b>Defaults</b>	There is no explicit CoS-to-Traffic Class QoS map applied; the implicit behavior is to match the IEEE 802.1Q recommendations for systems supporting eight Traffic Classes.
<b>Command Modes</b>	Interface configuration mode
<b>Description</b>	Use this command to apply a CoS-to-Traffic Class QoS map to an interface. Use the <b>no qos cos-traffic-class</b> command to remove the CoS-to-Traffic Class mapping.
<b>Usage Guidelines</b>	This command is not available when the interface is in the CEE Provisioning mode.
<b>Examples</b>	To apply a CoS-to-Traffic Class QoS map to an interface: <pre>switch(conf-if-te-0/1)#qos cos-traffic-class test</pre>
<b>See Also</b>	<b>qos map cos-traffic-class, qos trust, qos cos-mutation, show qos maps</b>

## qos map cos-mutation

Creates a QoS map for performing CoS-to-CoS mutation.

<b>Synopsis</b>	<b>qos map cos-mutation</b> <i>name</i> <i>cos0</i> <i>cos1</i> <i>cos2</i> <i>cos3</i> <i>cos4</i> <i>cos5</i> <i>cos6</i> <i>cos7</i>
	<b>no qos map cos-mutation</b> <i>name</i>
<b>Operands</b>	<p><i>name</i> Specifies a unique name across all CoS-to-CoS mutation QoS maps defined within the system. If the named CoS-to-CoS mutation QoS map does not exist, then it is created. If the named CoS-to-CoS mutation QoS map already exists then, it is updated and new mapping is automatically propagated to all interfaces bound to the QoS map.</p> <p><i>cos0</i> Sets the outbound CoS value for all packets with inbound CoS 0.</p> <p><i>cos1</i> Sets the outbound CoS value for all packets with inbound CoS 1.</p> <p><i>cos2</i> Sets the outbound CoS value for all packets with inbound CoS 2.</p> <p><i>cos3</i> Sets the outbound CoS value for all packets with inbound CoS 3.</p> <p><i>cos4</i> Sets the outbound CoS value for all packets with inbound CoS 4.</p> <p><i>cos5</i> Sets the outbound CoS value for all packets with inbound CoS 5.</p> <p><i>cos6</i> Sets the outbound CoS value for all packets with inbound CoS 6.</p> <p><i>cos7</i> Sets the outbound CoS value for all packets with inbound CoS 7.</p>
<b>Defaults</b>	There are no CoS-to-CoS mutation QoS maps defined.
<b>Command Modes</b>	Global configuration mode
<b>Description</b>	Use this command to create a QoS map for performing CoS-to-CoS Mutation. A CoS-to-CoS mutation takes an inbound CoS value and maps it to an outbound CoS value. The inbound CoS value is the user priority after any interface ingress QoS trust and Interface default CoS policy have been applied. The outbound CoS value is used in selecting Traffic Class and egress packet marking. The default is no CoS-to-CoS Mutation QoS maps defined. Use the <b>no qos map cos-mutation</b> <i>name</i> command to delete the named CoS-to-CoS mutation QoS map. A QoS map can only be deleted if it is not bound to any interface.
<b>Usage Guidelines</b>	There are no usage guidelines for this command.
<b>Examples</b>	<p>To create a CoS-to-CoS mutation QoS map to swap CoS 4 and CoS 5 and apply it on an interface, for example inbound CoS 4 is mapped to outbound CoS 5 and inbound CoS 5 is mapped to outbound CoS 4; all other CoS values go through unchanged:</p> <pre>switch(config)#qos map cos-mutation test 0 1 2 3 5 4 6 7 switch(config)#interface tengigabitethernet 0/1 switch(conf-if-te-0/1)#qos cos-mutation test</pre> <p>To delete a CoS-to-CoS mutation QoS map:</p> <pre>switch(config)#no qos map cos-mutation test</pre>

## 12 qos map cos-mutation

**See Also** qos cos-mutation, show qos maps



## qos map cos-traffic-class

Creates a QoS map for performing CoS-to-Traffic Class mapping.

<b>Synopsis</b>	<b>qos map cos-traffic-class</b> <i>name</i> <i>tc0 tc1 tc2 tc3 tc4 tc5 tc6 tc7</i>
	<b>no qos map cos-traffic-class</b>
<b>Operands.</b>	<p><i>name</i> Specifies the CoS-to-Traffic Class QoS map name. If the named CoS-to-Traffic Class QoS map does not exist, then it is created. If the named CoS-to-Traffic Class QoS map already exists, then it is updated and new mappings are automatically propagated to all interfaces bound to the QoS map.</p> <p><i>tc0</i> Sets the Traffic Class value for all packets with outbound CoS 0.</p> <p><i>tc1</i> Sets the Traffic Class value for all packets with outbound CoS 1.</p> <p><i>tc2</i> Sets the Traffic Class value for all packets with outbound CoS 2.</p> <p><i>tc3</i> Sets the Traffic Class value for all packets with outbound CoS 3.</p> <p><i>tc4</i> Sets the Traffic Class value for all packets with outbound CoS 4.</p> <p><i>tc5</i> Sets the Traffic Class value for all packets with outbound CoS 5.</p> <p><i>tc6</i> Sets the Traffic Class value for all packets with outbound CoS 6.</p> <p><i>tc7</i> Sets the Traffic Class value for all packets with outbound CoS 7.</p>
<b>Defaults</b>	There are no CoS-to-Traffic Class QoS maps defined.
<b>Command Modes</b>	Global configuration mode
<b>Description</b>	Use this command to create a QoS map for performing CoS-to-Traffic Class mapping. A CoS-to-Traffic Class QoS map takes an outbound CoS value and maps it to a Traffic Class. The outbound CoS value is used as the packet user priority after applying the configured interface QoS trust, interface default CoS, and CoS-to-CoS mutation policies. Traffic Class is a reference to a scheduler queue and packet servicing policy. Use the <b>no qos map cos-traffic-class</b> <i>name</i> command to delete the CoS-to-Traffic Class QoS map specified by the name. The CoS-to-Traffic Class QoS map can only be deleted when it is not bound to any interface. All other CoS values go through unchanged. This mapping matches the default behavior recommended in IEEE 802.1Q for systems supporting eight Traffic Classes.
<b>Usage Guidelines</b>	There are no usage guidelines for this command.
<b>Examples</b>	<p>To create a CoS-to-Traffic Class QoS map to map CoS 0 to Traffic Class 1 and CoS 1 to Traffic Class 0:</p> <pre>switch(config)#qos map cos-traffic-class test 1 0 2 3 4 5 6 7</pre> <p>To delete a CoS-to-Traffic Class QoS map:</p> <pre>switch(config)#no qos map cos-traffic-class test</pre>
<b>See Also</b>	<b>qos trust, qos map cos-mutation</b>

## 12 qos map cos-traffic-class

```
mTC0_WEIGHTmTC1_WEIGHTmTC2_WEIGHT mTC3_WEIGHT mTC4_WEIGHT mTC5_WEIGHT  
mTC6_WEIGHT  
mTC7_WEIGHTmTC0_WEIGHTmTC1_WEIGHTmTC2_WEIGHTmTC3_WEIGHTmTC4_WEIGHTmTC5_  
WEIGHTmTC6_WEIGHTmTC7_WEIGHT
```

## qos queue multicast scheduler

Configures the multicast Traffic Class packet expansion scheduler policy. All multicast Traffic Class packet expansion queues are serviced Deficit Weighted Round Robin (DWRR).

<b>Synopsis</b>	<b>qos queue multicast scheduler dwrr</b> <i>weight0 weight1 weight2 weight3</i> <b>no qos queue multicast scheduler</b>	
<b>Operands</b>	<b>dwrr</b>	Configures the DWRR multicast Traffic Class packet expansion policy.
	<i>weight0</i>	Sets the DWRR weight for multicast Traffic Class 0 packet expansion in units of bandwidth percentage. The sum of all weight values must equal 100 percent. The range of valid values is 0-100.
	<i>weight1</i>	Sets the DWRR weight for multicast Traffic Class 1 packet expansion in units of bandwidth percentage. The sum of all weight values must equal 100 percent. The range of valid values is 0-100.
	<i>weight2</i>	Sets the DWRR weight for multicast Traffic Class 2 packet expansion in units of bandwidth percentage. The sum of all weight values must equal 100 percent. The range of valid values is 0-100.
	<i>weight3</i>	Sets the DWRR weight for multicast Traffic Class 3 packet expansion in units of bandwidth percentage. The sum of all weight values must equal 100 percent. The range of valid values is 0-100.
<b>.Defaults</b>	The default weight value is 25 percent bandwidth for each multicast Traffic Class.	
<b>Command Modes</b>	Global configuration mode	
<b>Description</b>	Use this command to configure the multicast Traffic Class packet expansion scheduler policy. All multicast Traffic Class packet expansion queues are serviced Deficit Weighted Round Robin (DWRR). This multicast Traffic Class packet expansion scheduler policy is applied uniformly across the entire system. Use the <b>no qos queue multicast scheduler</b> command to return the multicast Traffic Class packet expansion scheduler to the default value.	
<b>Usage Guidelines</b>	There are no usage guidelines for this command.	
<b>Examples</b>	To set the multicast Traffic Class packet expansion scheduler for Traffic Class 0 getting 10 percent bandwidth, Traffic Class 1 getting 20 percent bandwidth, Traffic Class 2 getting 30 percent bandwidth, and Traffic Class 3 getting 40 percent bandwidth:  <pre>switch(config)#qos queue multicast scheduler dwrr 10 20 30 40</pre> To return the system to the default multicast Traffic Class packet expansion scheduler policy:  <pre>switch(config)#no qos queue multicast scheduler</pre>	
<b>See Also</b>	<b>qos rcv-queue multicast</b>	

## qos queue scheduler

Configures the Traffic Class packet scheduler policy.

**Synopsis** **qos queue scheduler strict-priority** *strict-priority number* **dwrr** *weight0 weight1 weight2 weight3 weight4 weight5 weight6 weight7*

**no qos queue scheduler**

**strict-priority** Configures the Strict Priority Traffic Class policy. All Strict Priority Traffic Classes are serviced before any DWRR Traffic Classes.

*strict-priority number*

Sets the number of the Strict Priority Traffic Class. These are the strict priority number highest Traffic Class, for example if the strict-priority number is 3, then the Strict Priority Traffic Class are Traffic Classes 7, 6, and 5. The range of valid values is 0-8.

**dwrr**

Configures the DWRR Traffic Class policy. There are a variable number of DWRR weight values accepted that are dependent on the setting of strict priority number. The strict priority number plus the number of DWRR weight values must always sum to 8 Traffic Classes.

**Operands**

*weight0*

Sets the DWRR weight for Traffic Class 0 in units of bandwidth percentage left over after servicing all of the Strict Priority Traffic Classes. The sum of all weight values must equal 100 percent. The *weight0* value is only valid when the strict priority number is less than 8. The range of valid values is 0-100 percent.

*weight1*

Sets the DWRR weight for Traffic Class 1 in units of bandwidth percentage left over after servicing all of the Strict Priority Traffic Classes. The sum of all weight values must equal 100 percent. The *weight0* value is only valid when the strict priority number is less than 7. The range of valid values is 0-100 percent.

*weight2*

Sets the DWRR weight for Traffic Class 2 in units of bandwidth percentage left over after servicing all of the Strict Priority Traffic Classes. The sum of all weight values must equal 100 percent. The *weight0* value is only valid when the strict priority number is less than 6. The range of valid values is 0-100 percent.

*weight3*

Sets the DWRR weight for Traffic Class 3 in units of bandwidth percentage left over after servicing all of the Strict Priority Traffic Classes. The sum of all weight values must equal 100 percent. The *weight 0* value is only valid when the strict priority number is less than 5. The range of valid values is 0-100 percent.

*weight4*

Sets the DWRR weight for Traffic Class 4 in units of bandwidth percentage left over after servicing all of the Strict Priority Traffic Classes. The sum of all weight values must equal 100 percent. The *weight0* value is only valid when the strict priority number is less than 4. The range of valid values is 0-100 percent.

- weight5* Sets the DWRR weight for Traffic Class 6 in units of bandwidth percentage left over after servicing all of the Strict Priority Traffic Classes. The sum of all weight values must equal 100 percent. The *weight0* value is only valid when the strict priority number is less than 3. The range of valid values is 0-100 percent.
- weight6* Sets the DWRR weight for Traffic Class 6 in units of bandwidth percentage left over after servicing all of the Strict Priority Traffic Classes. The sum of all weight values must equal 100 percent. The *weight0* value is only valid when the strict priority number is less than 2. The range of valid values is 0-100 percent.
- weight7* Sets the DWRR weight for Traffic Class 7 in units of bandwidth percentage left over after servicing all of the Strict Priority Traffic Classes. The sum of all weight values must equal 100 percent. The *weight0* value is only valid when the strict priority number is less than 1. The range of valid values is 0-100 percent.

**Defaults** The default strict priority value is 8. There is no default value for each weight value.

**Command Modes** Global configuration mode

**Description** Use this command to configure the Traffic Class packet scheduler policy. Eight Traffic Classes are supported with a configurable number of them being Strict Priority and any remaining ones being serviced DWRR. This Traffic Class packet scheduler policy is applied uniformly across the entire system. Actual Traffic Class packet scheduling is performed independently by each switch. Use the **no qos queue scheduler** command to return the Traffic Class packet scheduler to the default value.

**Usage Guidelines** There are no usage guidelines for this command.

**Examples** To set the Traffic Class packet scheduler for 4 Strict Priority Traffic Class and 4 DWRR Traffic Class with Traffic Class 0 getting 10 percent bandwidth, Traffic Class 1 getting 20 percent bandwidth, Traffic Class 2 getting 30 percent bandwidth, and Traffic Class 3 getting 40 percent bandwidth:

```
switch(config)#qos queue scheduler strict-priority 4 dwrr 10 20 30 40
```

To return the system to the default Traffic Class packet scheduler policy:

```
switch(config)#no qos queue scheduler
```

**See Also** [qos rcv-queue multicast](#)

**qos rcv-queue multicast rate-limit**

Configures a cap on the maximum rate for multicast packet expansion.

<b>Synopsis</b>	<b>qos rcv-queue multicast rate-limit</b> <i>rate</i> [ <b>burst</b> <i>burst-size</i> ] <b>no qos rcv-queue multicast rate-limit</b>
<b>Operands</b>	<p><b>rate</b> Specifies the maximum rate for multicast packet expansion in units of packets per second (pkt/s). This places a cap on the sum of the first level expansion, for example the ingress packets replicated for each egress switch plus the second level expansion, for example packets replicated for egress interfaces on the switch. The range of valid values is 5500-90000000 pkt/s.</p> <p><b>burst</b> <i>burst-size</i> Configures a cap on the maximum burst size for multicast packet expansion, for example packet replication. The burst size represents the maximum number of multicast packet expansion that can be performed back-to-back as a single burst in units of packets (pkt). The range of valid values is 50-65535 pkt.</p>
<b>Defaults</b>	The default burst size is 4096 packets. The default rate value is 3000000pkt/s.
<b>Command Modes</b>	Global configuration mode
<b>Description</b>	Use this command to configures a cap on the maximum rate for multicast packet expansion, for example packet replication. This rate limit is applied uniformly across the entire system. This rate limit is enforced independently by each switch. Use the <b>no qos rcv-queue multicast rate-limit</b> command to return the multicast packet expansion rate limit to the default settings.
<b>Usage Guidelines</b>	There are no usage guidelines for this command.
<b>Examples</b>	<p>To lower the maximum multicast packet expansion rate to 10000pkt/s:</p> <pre>switch(config)#qos rcv-queue multicast rate-limit 10000</pre> <p>To return the system to the default multicast packet expansion rate limit values:</p> <pre>switch(config)#no qos rcv-queue multicast rate-limit</pre>
<b>See Also</b>	<b>qos rcv-queue multicast</b>

## qos rcv-queue multicast threshold

Configures a cap on the maximum queue depth for multicast packet expansion queues.

<b>Synopsis</b>	<b>qos rcv-queue multicast threshold</b> <i>tdt0 tdt1 tdt2 tdt3</i> <b>no qos rcv-queue multicast threshold</b>	
<b>Operands</b>	<i>tdt0</i>	Sets the Tail Drop Threshold for multicast Traffic Class 0 packet expansion queue in units of packets (pkt). The range of valid values is 0-2047 packets.
	<i>tdt1</i>	Sets the Tail Drop Threshold for multicast Traffic Class 1 packet expansion queue in units of packets (pkt). The range of valid values is 0-2047 packets.
	<i>tdt2</i>	Sets the Tail Drop Threshold for multicast Traffic Class 2 packet expansion queue in units of packets (pkt). The range of valid values is 0-2047 packets.
	<i>tdt3</i>	Sets the Tail Drop Threshold for multicast Traffic Class 3 packet expansion queue in units of packets (pkt). The range of valid values is 0-2047 packets.
<b>.Defaults</b>	The default is 64 packets for each multicast Traffic Class.	
<b>Command Modes</b>	Global configuration mode	
<b>Description</b>	Use this command to configure a cap on the maximum queue depth for multicast packet expansion queues. The individual Tail Drop Threshold is specified for each of the four multicast traffic classes. These Tail Drop Thresholds are applied uniformly across the entire system. These queue depths are enforced independently by each switch. Use the <b>no qos rcv-queue multicast threshold</b> command to return the multicast expansion queues to the default value.	
<b>Usage Guidelines</b>	There are no usage guidelines for this command.	
<b>Examples</b>	To increase multicast packet expansion Tail Drop Threshold to 1000pkt for each multicast Traffic Class: <pre>switch(config)#<b>qos rcv-queue multicast threshold</b> 1000 1000 1000 1000</pre> To return the system to the default multicast packet expansion Tail Drop Threshold value: <pre>switch(config)#<b>no qos rcv-queue multicast threshold</b></pre>	
<b>See Also</b>	<b>qos rcv-queue multicast</b>	

**qos trust cos**

Specifies the interface QoS trust mode for incoming traffic.

<b>Synopsis</b>	<b>qos trust cos</b> <b>no qos trust</b>
<b>Operands</b>	none
<b>Defaults</b>	The QoS trust CoS mode set to the untrusted state.
<b>Command Modes</b>	Interface configuration mode
<b>Description</b>	Use this command to specify the interface ingress QoS trust mode, which controls user priority mapping of incoming traffic. The untrusted mode overrides all incoming priority markings with the Interface Default CoS. The CoS mode sets the user priority based on the incoming CoS value, if the incoming packet is not priority tagged, then fallback is to the Interface Default CoS value. Use the <b>no qos trust</b> command to return to the default.
<b>Usage Guidelines</b>	When a CEE map is applied on an interface, the <b>qos trust</b> command is not allowed. The CEE map always puts the interface in the CoS trust mode. This command is not applicable for port-channel interfaces.
<b>Examples</b>	To set the interface QoS to the trust mode: <pre>switch(conf-if-te-0/1)#qos trust cos</pre> <p>To return the interface QoS to the default value or to the untrusted state:</p> <pre>switch(conf-if-te-0/1)#no qos trust</pre> <p>When a CEE map is applied, the switch does not allow the <b>qos trust cos</b> command and displays the following error:</p> <pre>switch(conf-if-te-0/1)#cee demo switch(conf-if-te-0/1)#qos trust cos % Error: QoS is not in non-CEE Provisioning mode</pre>
<b>See Also</b>	<b>qos cos, show qos</b>



## show cee maps

Displays information on the defined CEE maps.

- Synopsis** `show cee maps name`
- Operands** `name` Restricts the output to report on only the named CEE map.
- Defaults** The default behavior without the optional operand is to report on all defined CEE maps.
- Command Modes** EXEC mode
- Description** Use this command to display information on a specified defined CEE map or on all of the defined CEE maps. For each CEE map, the configuration state is displayed with a list of all of the Layer 2 interfaces bound to the CEE map.
- Usage Guidelines** There are no usage guidelines for this command.
- Examples** To display information on all of the defined CEE maps:

```
switch#show cee maps
CEE Map test
  Precedence 1
  Priority Group Table
    0: Weight 50, PFC Enabled, TrafficClass 4, BW% 50
    1: Weight 50, PFC Disabled, TrafficClass 2, BW% 50
    15.0: PFC Disabled, TrafficClass 6
    15.1: PFC Disabled
    15.2: PFC Disabled
    15.3: PFC Disabled
    15.4: PFC Disabled
    15.5: PFC Disabled
    15.6: PFC Disabled
    15.7: PFC Disabled
  Priority Table
    CoS:   0   1   2   3   4   5   6   7
    -----
    PGID:  1   1   0   0   1   1   1 15.0
    FCoE CoS: 3
    Enabled on the following interfaces
    te0/4
```

**See Also** `cee`, `cee-map`

## show qos flowcontrol interface

Displays all of the configured flow control information for an interface.

<b>Synopsis</b>	<b>show qos flowcontrol interface</b> ( <b>tengigabitethernet slot/port</b>   <b>linecard slot</b>   <b>portset chip</b>   <b>all</b> )
<b>Operands</b>	<p><b>tengigabitethernet</b> Reports QoS flow control statistics for a single 10 Gbps Ethernet interface.</p> <p style="padding-left: 2em;"><i>slot</i> Specifies the 10 Gbps Ethernet linecard slot number within the chassis.</p> <p style="padding-left: 2em;"><i>port</i> Specifies the 10 Gbps Ethernet port number within the linecard.</p> <p><b>linecard portset</b> Reports the QoS flow control statistics for all 10 Gbps Ethernet interfaces within an ASIC.</p> <p style="padding-left: 2em;"><i>slot</i> Specifies the ASIC linecard slot number within the chassis.</p> <p style="padding-left: 2em;"><i>chip</i> Specifies the ASIC number within the linecard.</p> <p><b>all</b> Reports QoS flow control statistics for all interfaces within the system.</p>
<b>Command Modes</b>	EXEC mode
<b>Description</b>	Use this command to display all of the configured flow control information for a specific interface.
<b>Usage Guidelines</b>	Use this command to display the runtime state retrieved from the dataplane reflecting the operation of 802.3x pause or Priority Flow Control (PFC) on an interface. The administrative state for pause generation and reception or processing is presented for the interface (802.3x mode) or for each CoS (PFC mode). TX_Pause frame generation statistics are always presented for the interface. The RX_Pause BitTimes is presented for the interface (802.3x mode) or for each CoS (PFC mode). When PFC is deployed under the CEE Provisioning model, then the command reports whether the Data Center Bridging eXchange protocol (DCBX) has overridden the user configuration, for example when the DCBX detects a mis-configuration between CEE peers, it disables PFC operationally.
<b>Examples</b>	To display all of the configured flow control information for a 10 Gbps Ethernet interface:

```
switch#show qos flowcontrol interface tengigabitethernet 0/1
Interface TenGigabitEthernet 0/1
  Mode PFC
  DCBX enabled for PFC negotiation
  TX 0 frames
  TX TX RX RX Output Paused
  CoS Admin Oper Admin Oper 512 BitTimes
-----
  0 Off Off Off Off 0
  1 Off Off Off Off 0
  2 On Off On Off 0
  3 Off Off Off Off 0
  4 Off Off Off Off 0
  5 Off Off Off Off 0
  6 Off Off Off Off 0
  7 Off Off Off Off 0
```

**See Also** **show qos interface, show cee maps**

## show qos interface

Displays a summary of all QoS configurations applied on an interface.

<b>Synopsis</b>	<b>show qos interface</b> { <b>tengigabitethernet slot/port</b>   <b>linecard slot portset chip</b>   <b>all</b> }
<b>Operands</b>	<p><b>tengigabitethernet</b> Reports QoS configuration for a single 10 Gbps Ethernet interface.</p> <p style="padding-left: 2em;"><i>slot</i> Specifies the 10 Gbps Ethernet linecard slot number within the chassis.</p> <p style="padding-left: 2em;"><i>port</i> Specifies the 10 Gbps Ethernet port number within the linecard.</p> <p><b>linecard portset</b> Reports the QoS configuration for all 10 Gbps Ethernet interfaces within an ASIC.</p> <p style="padding-left: 2em;"><i>slot</i> Specifies the ASIC linecard slot number within the chassis.</p> <p style="padding-left: 2em;"><i>chip</i> Specifies the ASIC number within the linecard.</p> <p><b>all</b> Reports QoS configurations for all interfaces within the system.</p>
<b>Defaults</b>	There are no default configurations for this command.
<b>Command Modes</b>	EXEC mode
<b>Description</b>	Use this command to display a summary of all QoS configuration applied on an interface, including QoS Provisioning mode, CEE map, Layer 2 priority, Traffic Class mapping, congestion control, and the scheduler policy.
<b>Usage Guidelines</b>	If no interface is specified, QoS information about all interfaces is displayed.
<b>Examples</b>	To display all of the configured QoS information for a 10 Gbps Ethernet interface:

```
switch#show qos interface tengigabitethernet 0/1
Interface TenGigabitEthernet 0/1
  Provisioning mode cee
  CEE Map demo
  Default CoS 0
  Interface trust cos
  CoS-to-CoS Mutation map 'default'
      In-CoS:   0   1   2   3   4   5   6   7
  -----
  Out-CoS/TrafficClass: 0/4 1/4 2/6 3/4 4/4 5/4 6/4 7/4
  Tail Drop Threshold 1081344 bytes
  Per-CoS Tail Drop Threshold (bytes)
      CoS:     0     1     2     3     4     5     6     7
  -----
  Threshold: 129761 129761 129761 129761 129761 129761 129761 129761
  Flow control mode PFC
  CoS2 TX on, RX on
  Multicast Packet Expansion Rate Limit 3000000 pkt/s, max burst 4096 pkts
  Multicast Packet Expansion Tail Drop Threshold (packets)
  TrafficClass:   0     1     2     3
  -----
  Threshold:     64    64    64    64
```

## 12 show qos interface

```
Traffic Class Scheduler configured for 0 Strict Priority queues
TrafficClass:  0  1  2  3  4  5  6  7
-----
DWRRWeight:   0  0  0  0 60  0 40  0
Multicast Packet Expansion Traffic Class Scheduler
TrafficClass:  0  1  2  3
-----
DWRRWeight:   25 25 25 25
```

**See Also**    **cee-map, priority table**

## show qos maps

Displays information on the defined QoS maps.

<b>Synopsis</b>	<b>show qos maps</b> [{ <b>cos-mutation</b> [ <i>name</i> ]   <b>cos-traffic-class</b> [ <i>name</i> ]} ]
<b>Operands</b>	<p><b>cos-mutation</b> <i>name</i> Specifies to report on only the named CoS-to-CoS mutation QoS map.</p> <p><b>cos-traffic-class</b> <i>name</i> Specifies to report on only the named CoS-to-Traffic Class QoS maps.</p>
<b>Defaults</b>	The default behavior without any specified operands is to report on all defined QoS maps.
<b>Command Modes</b>	EXEC mode
<b>Description</b>	Use this command to display information on the QoS defined maps. For each QoS map, the configuration state is displayed with a list of all interfaces bound to the QoS map.
<b>Usage Guidelines</b>	There are no usage guidelines for this command.
<b>Examples</b>	To display information on the defined QoS maps:

```
switch#show qos maps
  CoS-to-CoS Mutation map 'test'
    In-CoS:  0  1  2  3  4  5  6  7
    -----
    Out-CoS:  0  1  2  3  5  4  6  7
    Enabled on the following interfaces:
    Te 0/5

  CoS-to-Traffic Class map 'test'
    Out-CoS:  0  1  2  3  4  5  6  7
    -----
    TrafficClass:  0  1  2  3  5  4  6  7
    Enabled on the following interfaces:
    Te 0/5
```

**See Also**    **qos maps, show qos interface**

## show qos queue interface

Displays the runtime state retrieved from the interface reflecting the number of packets and bytes sent and received for each priority.

**Synopsis** `show qos queue interface {tengigabitethernet slot/port | all}`

**Operands** `tengigabitethernet`

Specifies the 10 Gbps Ethernet interface.

`slot` Specifies the 10 Gbps Ethernet interface linecard slot number.

`port` Specifies the 10 Gbps Ethernet interface port number within the linecard.

`all` Reports QoS statistics for all 10 Gbps interfaces within the system.

**Command Modes** EXEC mode

**Description** Use this command to display the runtime state retrieved from the interface reflecting the number of packets and bytes sent and received for each priority.

**Usage Guidelines** For a stand-alone switch, all ASICs are considered as slot number zero (0).

**Examples** To display the queueing information for a 10 Gbps Ethernet interface:

```
switch#show qos queue interface tengigabitethernet 0/2
Interface TenGigabitEthernet 0/2
```

CoS	RX Packets	RX Bytes	TC	TX Packets	TX Bytes
0	680458	87098624	0	0	0
1	0	0	1	32318	0
2	0	0	2	0	0
3	0	0	3	0	0
4	0	0	4	0	0
5	0	0	5	0	0
6	0	0	6	0	0
7	0	0	7	0	0

**See Also** `qos maps`, `cee-map`

## show qos rcv-queue interface

Displays a summary of all QoS configurations applied to a Layer 2 Interface.

**Synopsis** `show qos rcv-queue interface {tengigabitethernet slot/port | all}`

**Operands** `tengigabitethernet`

Specifies the 10 Gbps Ethernet interface.

`slot` Specifies the 10 Gbps Ethernet interface linecard slot number.

`port` Specifies the 10 Gbps Ethernet interface port number within the linecard.

**all** Reports QoS configurations for all 10 Gbps Ethernet interfaces within the system.

**Command Modes** EXEC mode

**Description** Use this command to display a summary of all QoS configurations applied to an Layer 2 Interface. This includes the QoS Provisioning mode, CEE Map, Layer 2 Priority, Traffic Class Mapping, Congestion Control, and the Scheduler policy.

**Usage Guidelines** There are no usage guidelines for this command.

**Examples** To display the runtime ingress queue state information retrieved from the dataplane for a 10 Gbps Ethernet interface:

```
switch#show qos rcv-queue interface tengigabitethernet 0/2
Interface TenGigabitEthernet 0/2
  In-use 404019 bytes, Total buffer 1081344 bytes
  0 packets dropped
  
```

CoS	In-use Bytes	Max Bytes
0	0	1081344
1	0	1081344
2	404019	1081344
3	0	1081344
4	0	1081344
5	0	1081344
6	0	1081344
7	0	1081344

**See Also** `show qos rcv-queue multicast`

## show qos rcv-queue multicast

Displays the runtime state retrieved from the dataplane reflecting any multicast packet expansion packet drops resulting from a queue crossing the maximum queue depth.

<b>Synopsis</b>	<b>show qos rcv-queue multicast {tengigabitethernet slot/port   all}</b>
<b>Operands</b>	<p><b>tengigabitethernet</b> Specifies the 10 Gbps Ethernet interface.</p> <p style="padding-left: 2em;"><i>slot</i> Specifies the 10 Gbps Ethernet interface linecard slot number.</p> <p style="padding-left: 2em;"><i>port</i> Specifies the 10 Gbps Ethernet interface port number within the linecard.</p> <p><b>all</b> Reports QoS multicast packet expansion receive queueing statistics for all ASICs within the system.</p>
<b>Defaults</b>	There are no default configurations for this command.
<b>Command Modes</b>	EXEC mode
<b>Description</b>	Use this command to display the runtime state information retrieved from the interface reflecting any multicast packet expansion packet drops resulting from a queue crossing the maximum queue depth.
<b>Usage Guidelines</b>	For a stand-alone switch, all ASICs are considered as slot number zero (0).
<b>Examples</b>	<p>To display the queueing information:</p> <pre> switch#show qos rcv-queue multicast tengigabitethernet 0/2 Dropped Counts   Linecard/Portset          TC 0          TC 1          TC 2          TC 3 -----                 0/0                0                0                0                0 </pre>
<b>See Also</b>	<b>show qos rcv-queue interface</b>



## Port Authentication Commands

---

### clear dot1x statistics

Clears all dot1x statistics.

**Synopsis** clear dot1x statistics

**Operands** none

**Defaults** There are no defaults for this command.

**Command Modes** Privileged access mode

**Description** Use this command to clear all accumulated port authentication statistics on all ports.

**Usage Guidelines** There are no usage guidelines for this command.

**Examples** To clear dot1x statistics:  

```
switch#clear dot1x statistics
```

**See Also** clear dot1x statistics interface

## 13 clear dot1x statistics interface

### clear dot1x statistics interface

Clears the dot1x statistics for a port

**Synopsis** `clear dot1x statistics interface [tengigabitethernet slot/port]`

**Operands** `tengigabitethernet` Specifies a valid 10 Gbps Ethernet interface.  
`slot` Specifies a valid slot number.  
`port` Specifies a valid port number.

**Defaults** There are no defaults for this command.

**Command Modes** Privileged access mode

**Description** Use this command to clear all of the dot1x statistics for a specific interface port.

**Usage Guidelines** There are no usage guidelines for this command.

**Examples** To clear dot1x statistics on a port:  
`switch#clear dot1x statistics interface tengigabitethernet 0/1`

**See Also** `clear dot1x statistics`

## dot1x authentication

Enables dot1x on a port.

<b>Synopsis</b>	<b>dot1x authentication</b> <b>no dot1x authentication</b>
<b>Operands</b>	none
<b>Defaults</b>	There are no defaults for this command.
<b>Command Modes</b>	Interface configuration mode
<b>Description</b>	Use this command to enable dot1x on a port. Use the <b>no dot1x authentication</b> command to disable dot1x on the port and remove the configuration from 802.1X management.
<b>Usage Guidelines</b>	There are no usage guidelines for this command.
<b>Examples</b>	To enable dot1x on a port: <pre>switch(config)#<b>interface tengigabitethernet</b> 0/1 switch(conf-if-te-0/1)#<b>dot1x authentication</b></pre>
<b>See Also</b>	none

## 13 dot1x enable

### dot1x enable

Enables 802.1X authentication globally.

**Synopsis**     **dot1x enable**  
              **no dot1x enable**

**Operands**    none

**Defaults**    By default, authentication is disabled globally.

**Command Modes**   Global configuration mode

**Description**    Use this command to globally enable 802.1X authentication. Use the **no dot1x enable** command to disable 802.1X authentication globally.

**Usage Guidelines**   There are no usage guidelines for this command.

**Examples**        To enable 802.1X authentication globally:

```
switch(config)#dot1x enable
```

**See Also**        none

## dot1x port-control

Controls the authorization of a port state.

<b>Synopsis</b>	<b>dot1x port-control auto   force-authorized   force-unauthorized</b> <b>no dot1x port-control</b>
<b>Operands</b>	<b>auto</b> Enables authentication on port. <b>forced-authorized</b> Forces a port to remain in an authorized state. <b>force-unauthorized</b> Forces a port to remain in an unauthorized state.
<b>Defaults</b>	The default port state is auto.
<b>Command Modes</b>	Interface configuration mode
<b>Description</b>	Use this command to control the authorization of a port state. Use the <b>no dot1x port-control</b> command to return to the default setting.
<b>Usage Guidelines</b>	There are no usage guidelines for this command.
<b>Examples</b>	To enable the port state to auto: <pre>switch(config)#<b>interface</b> tengigabitethernet 0/1 switch(conf-if-te-0/1)#<b>dot1x port-control auto</b></pre>
<b>See Also</b>	none

**dot1x quiet-period**

Sets the number of seconds that a switch remains quiet between a failed authentication and an attempt to retry authentication.

<b>Synopsis</b>	<b>dot1x quiet-period interval</b> <i>seconds</i> <b>no dot1x quiet-period</b>
<b>Operands</b>	<b>interval</b> <i>seconds</i> Specifies the time in seconds between attempts at authentication. The range of valid values is 1-65535.
<b>Defaults</b>	The default time is 60 seconds.
<b>Command Modes</b>	Interface configuration mode
<b>Description</b>	Use this command to set the time in seconds after which a switch attempts to perform authentication after a failed authentication. Use the <b>no dot1x quiet-period</b> command to return to the default setting. When a switch cannot authenticate a client, the switch remains idle for a quiet-period interval of time, then attempts the operation again.
<b>Usage Guidelines</b>	Changing the quiet-period interval time to a number lower than the default can result in a faster response time.
<b>Examples</b>	To change the interval time to 200 seconds: <pre>switch(config)#<b>interface</b> tengigabiethernet 0/1 switch(conf-if-te-0/1)#<b>dot1x quiet-period</b> 200</pre>
<b>See Also</b>	none

## dot1x reauthenticate interface

Initiates reauthentication on a specified interface.

<b>Synopsis</b>	<b>dot1x reauthenticate interface</b> <i>name</i>
<b>Operands</b>	<i>name</i> Specifies the name of the interface.
<b>Defaults</b>	There are no defaults for this command.
<b>Command Modes</b>	Privileged EXEC mode
<b>Description</b>	Use this command to initiate the reauthentication on a specified interface.
<b>Usage Guidelines</b>	There are no usage guidelines for this command.
<b>Examples</b>	To initiate reauthentication on interface tengigabitethernet 0/1: <pre>switch#dot1x reauthenticate interface tengigabitethernet 0/1</pre>
<b>See Also</b>	none

## dot1x reauthentication

Enables reauthentication on a port.

**Synopsis** `dot1x reauthentication`

**Operands** none

**Defaults** There are no defaults for this command.

**Command Modes** Interface configuration mode

**Description** Use this command to enable reauthentication on a port.

**Usage Guidelines** There are no usage guidelines for this command.

**Examples** To enable reauthentication on a port:

```
switch(config)#interface tengigabitethernet 0/1  
switch(conf-if-te-0/1)#dot1x reauthentication
```

**See Also** none



## dot1x reauthMax

Sets the maximum number of times that a port attempts to reauthenticate.

<b>Synopsis</b>	<b>dot1x reauthMax</b> <i>number</i> <b>no dot1x reauthMax</b>
<b>Operands</b>	<i>number</i> Specifies the maximum number of reauthentication attempts before the port goes to the unauthorized state. The range of valid values is 1-10.
<b>Defaults</b>	The default number of times that a port attempts authentication is two.
<b>Command Modes</b>	Interface configuration mode
<b>Description</b>	Use this command to set the maximum number of times that a port attempts to reauthenticate before a port changes to the unauthorized state. Use the <b>no dot1x reauthMax</b> command to return to the default setting.
<b>Usage Guidelines</b>	There are no usage guidelines for this command.
<b>Examples</b>	To set the maximum number of reauthentication attempts to 5: <pre>switch(config)#<b>interface tengigabitethernet</b> 0/1 switch(conf-if-te-0/1)#<b>dot1x reauthMax</b> 5</pre> To set the reauthentication maximum to the default value: <pre>switch(config)#<b>interface tengigabitethernet</b> 0/1 switch(conf-if-te-0/1)#<b>no dot1x reauthMax</b></pre>
<b>See Also</b>	none

## dot1x timeout re-authperiod

Sets the number of seconds between reauthorization attempts.

<b>Synopsis</b>	<b>dot1x timeout re-authperiod</b> <i>seconds</i>
<b>Operands</b>	<i>seconds</i> Specifies the seconds between reauthorization attempts. The range of valid values is 1-4294967295.
<b>Defaults</b>	The default time is 3600 seconds.
<b>Command Modes</b>	Interface configuration mode
<b>Description</b>	Use this command to set the number of seconds between reauthorization attempts.
<b>Usage Guidelines</b>	There are no usage guidelines for this command.
<b>Examples</b>	To set 25 seconds as the amount of time between reauthorization attempts: <pre>switch(config)#<b>interface</b> tengigabitethernet 0/1 switch(conf-if-te-0/1)#<b>dot1x timeout re-authperiod 25</b></pre>
<b>See Also</b>	none

## dot1x timeout server-timeout

Sets the authentication sever response timeout.

<b>Synopsis</b>	<b>dot1x timeout server-timeout</b> <i>seconds</i>
<b>Operands</b>	<i>seconds</i> Specifies the number of seconds that a switch waits for the transmission of packets by the switch to the authentication server. The range of valid values is 1-65535.
<b>Defaults</b>	The default timeout is 30 seconds.
<b>Command Modes</b>	Interface configuration mode
<b>Description</b>	Use this command to set the authentication sever response timeout.
<b>Usage Guidelines</b>	There are no usage guidelines for this command.
<b>Examples</b>	To set 40 seconds as the switch-to-authentication server transmission time: <pre>switch(config)#interface tengigabitethernet 0/1 switch(config-if)#dot1x timeout server-timeout 40</pre>
<b>See Also</b>	none

## dot1x timeout supp-timeout

Sets the time in seconds that a switch waits for a response to an Extensible Authentication Protocol (EAP) request frame from the client before resending the request.

<b>Synopsis</b>	<b>dot1x timeout supp-timeout</b> <i>seconds</i>
<b>Operands</b>	<i>seconds</i> Specifies the number of seconds that the switch waits for a response to the EAP frame. The range of valid values is 1-65535.
<b>Defaults</b>	The default timeout is 30 seconds.
<b>Command Modes</b>	Interface configuration mode
<b>Description</b>	Use this command to specify the EAP response timeout.
<b>Usage Guidelines</b>	There are no usage guidelines for this command.
<b>Examples</b>	To set 45 seconds as the switch-to-client retransmission time for the EAP request frame: <pre>switch(conf-if-te-0/1)#dot1x timeout supp-timeout 40</pre>
<b>See Also</b>	none

## dot1x timeout tx-period

Sets the number of seconds that the switch waits for a response to an Extensible Authentication Protocol (EAP) request or identity frame from the client before retransmitting the request.

<b>Synopsis</b>	<b>dot1x timeout tx-period</b> <i>seconds</i>
<b>Operands</b>	<i>seconds</i> Specifies the time in seconds between successive request ID attempts. The range of valid values is 1-65535.
<b>Defaults</b>	The default timeout is 30 seconds.
<b>Command Modes</b>	Interface configuration mode
<b>Description</b>	Use this command to set the interval between successive attempts to request an ID (EAP ID Req).
<b>Usage Guidelines</b>	There are no usage guidelines for this command.
<b>Examples</b>	To set 34 as the number of seconds to wait for a response to an EAP-request or identity frame from the client before retransmitting the request:  <pre>switch(config)#<b>interface tengigabitethernet</b> 0/1 switch(config-if)#<b>dot1x timeout tx-period</b> 34</pre>
<b>See Also</b>	none

**show dot1x**

Displays the overall state of dot1x on the system.

<b>Synopsis</b>	<b>show dot1x</b>
<b>Operands</b>	none
<b>Defaults</b>	There are no defaults for this command.
<b>Command Modes</b>	EXEC mode
<b>Description</b>	Use this command to display the overall state of dot1x on the system.
<b>Usage Guidelines</b>	There are no usage guidelines for this command.
<b>Examples</b>	To display the state of the system: <pre> switch#<b>show dot1x</b> 802.1X Port-Based Authentication Enabled PAE Capability:           Authenticator Only Protocol Version:        2 Auth Server:             RADIUS  RADIUS Configuration ----- Position:                 1 Server Address:           172.21.162.51 Port:                     1812 Secret:                   sharedsecret Position:                 2 Server Address:           10.32.154.113 Port:                     1812 Secret:                   sharedsecret </pre>
<b>See Also</b>	none

**show dot1x all**

Displays detailed information for all of the ports.

<b>Synopsis</b>	<b>show dot1x all</b>
<b>Operands</b>	none
<b>Defaults</b>	There are no defaults for this command.
<b>Command Modes</b>	EXEC mode
<b>Description</b>	Use this command to display detailed information for all of the ports.
<b>Usage Guidelines</b>	There are no usage guidelines for this command.
<b>Examples</b>	To display detailed information for all of the ports:

```

switch#show dot1x all
802.1X Port-Based Authentication Enabled
PAE Capability:          Authenticator Only
Protocol Version:       2
Auth Server:           RADIUS

RADIUS Configuration
-----
Position:               1
Server Address:        172.21.162.51
Port:                  1812
Secret:                sharedsecret

Position:               2
Server Address:        10.32.154.113
Port:                  1812
Secret:                sharedsecret

802.1X info for interface te0/1
-----
Port Control:          Auto
Port Auth Status:      Unauthorized
Protocol Version:       2
ReAuthentication:      Disabled
Auth Fail Max Attempts: 0
ReAuth Max:            2
Tx Period:             30 seconds
Quiet Period:          60 seconds
Supplicant Timeout:    30 seconds
Server Timeout:        30 seconds
Re-Auth Interval:      3600 seconds
PAE State:              Connected
BE State:               Invalid
Supplicant Name:       --
Supplicant Address:    0000.0000.0000
Current Id:            1
Id From Server:        0

```

## 13 show dot1x all

**See Also** none



## show dot1x diagnostics interface

Displays all diagnostics information for the authenticator associated with a port.

<b>Synopsis</b>	<b>show dot1x diagnostics interface</b> <i>name</i>
<b>Operands</b>	<i>name</i> Specifies the name of the interface.
<b>Defaults</b>	There are no defaults for this command.
<b>Command Modes</b>	EXEC mode
<b>Description</b>	Use this command to display all diagnostics information for the authenticator associated with a port.
<b>Usage Guidelines</b>	There are no usage guidelines for this command.
<b>Examples</b>	To display all diagnostics information for the authenticator associated with a port: <pre>switch#show dot1x diagnostics interface tengigabitethernet 0/1 802.1X Diagnostics for interface te0/1 authEnterConnecting: 0 authEaplogoffWhileConnecting: 1 authEnterAuthenticating: 0 authSuccessWhileAuthenticating: 0 authTimeoutWhileAuthenticating: 0 authFailWhileAuthenticating: 0 authEapstartWhileAuthenticating: 0 authEaplogoggWhileAuthenticating: 0 authReauthsWhileAuthenticated: 0 authEapstartWhileAuthenticated: 0 authEaplogoffWhileAuthenticated: 0 BackendResponses: 0 BackendAccessChallenges: 0 BackendOtherrequestToSupplicant: 0 BackendAuthSuccess: 0 BackendAuthFails: 0</pre>
<b>See Also</b>	none

**show dot1x interface**

Displays the state of a specified interface.

<b>Synopsis</b>	<b>show dot1x interface</b> <i>name</i>
<b>Operands</b>	<i>name</i> Specifies the name of the interface.
<b>Defaults</b>	There are no defaults for this command.
<b>Command Modes</b>	EXEC mode
<b>Description</b>	Use this command to display the state of a specified interface.
<b>Usage Guidelines</b>	There are no usage guidelines for this command.
<b>Examples</b>	To display the state of 10 Gbps Ethernet interface 0/1: <pre> switch#show dot1x interface tengigabitethernet 0/1 Dot1x Global Status:      Enabled 802.1X info for interface te0/1 ----- Port Control:             Auto Port Auth Status:        Unauthorized Protocol Version:        2 ReAuthentication:        Disabled Auth Fail Max Attempts:  0 ReAuth Max:              2 Tx Period:                30 seconds Quiet Period:            60 seconds Supplicant Timeout:     30 seconds Server Timeout:         30 seconds Re-Auth Interval:       3600 seconds PAE State:               Connected BE State:                 Invalid Supplicant Name:         -- Supplicant Address:     0000.0000.0000 Current ID:              1 Id From Server:         0 </pre>
<b>See Also</b>	none

## show dot1x session-info interface

Displays all statistical information of an established session.

<b>Synopsis</b>	<b>show dot1x session-info interface</b> <i>name</i>
<b>Operands</b>	<i>name</i> Specifies the name of the interface.
<b>Defaults</b>	There are no defaults for this command.
<b>Command Modes</b>	EXEC mode
<b>Description</b>	Use this command to display all statistical information of the established session for a specified interface.
<b>Usage Guidelines</b>	There are no usage guidelines for this command.
<b>Examples</b>	To display all statistical information of the established session: <pre>switch#show dot1x session-info interface tengigabitethernet 0/1 802.1X Session info for te0/1 ----- User Name:                testuser Session Time:             3 mins 34 secs Terminate Cause:         Not terminated yet</pre>
<b>See Also</b>	none

## 13 show dot1x statistics interface

### show dot1x statistics interface

Displays the statistics of a specified interface.

<b>Synopsis</b>	<b>show dot1x statistics interface</b> <i>name</i>
<b>Operands</b>	<i>name</i> Specifies the name of the interface for which to display information.
<b>Defaults</b>	There are no defaults for this command.
<b>Command Modes</b>	EXEC mode
<b>Description</b>	Use this command to display the statistics of a specified interface.
<b>Usage Guidelines</b>	There are no usage guidelines for this command.
<b>Examples</b>	To display the statistics for 10 Gbps Ethernet interface 0/1: <pre>switch#show dot1x statistics interface tengigabitethernet 0/1 802.1X statistics for interface te0/1 EAPOL Frames Rx: 0 - EAPOL Frames Tx: 0 EAPOL Start Frames Rx: 0 - EAPOL Logoff Frames Rx: 0 EAP Rsp/Id Frames Rx: 2 - EAP Response Frames Rx: 10 EAP Req/Id Frames Tx: 35 - EAP Request Frames Tx: 0 Invalid EAPOL Frames Rx: 0 - EAP Length Error Frames Rx: 0 EAPOL Last Frame Version Rx: 0 - EAPOL Last Frame Src: 0000.0000.0000</pre>
<b>See Also</b>	none